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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(21) International Application Number: PCT/US99/30909 (22) International Filing Date: 23 December 1999 (23.12.99) (30) Priority Data: <div style="display: flex; justify-content: space-between;"> <div>09/221,298</div> <div>23 December 1998 (23.12.98)</div> <div>US</div> </div> <div style="display: flex; justify-content: space-between;"> <div>09/347,496</div> <div>2 July 1999 (02.07.99)</div> <div>US</div> </div> <div style="display: flex; justify-content: space-between;"> <div>09/401,064</div> <div>22 September 1999 (22.09.99)</div> <div>US</div> </div> <div style="display: flex; justify-content: space-between;"> <div>09/444,242</div> <div>19 November 1999 (19.11.99)</div> <div>US</div> </div> <div style="display: flex; justify-content: space-between;"> <div>09/454,150</div> <div>2 December 1999 (02.12.99)</div> <div>US</div> </div> (71) Applicant (for all designated States except US): CORIXA CORPORATION [US/US]; Suite 200, 1124 Columbia Street, Seattle, WA 98104 (US). (72) Inventors; and (75) Inventors/Applicants (for US only): XU, Jiangchun [US/US]; 15805 SE 43rd Place, Bellevue, WA 98006 (US). LODES, Michael, J. [US/US]; 9223 - 36th Avenue SW, Seattle, WA 98126 (US). SECRIST, Heather [US/US]; 3844 - 35th Avenue West, Seattle, WA 98199 (US). BENSON, Darin, R. [US/US]; 723 N. 48th Street, Seattle, WA 98104 (US). MEAGHER, Madeleine, Joy [US/US]; 3819 Interlake Avenue N., Seattle, WA 98103 (US). STOLK, John [US/US]; 7436 NE 144th Place, Bothell, WA 98011		<div style="display: flex; justify-content: space-between;"> <div> (US). WANG, Tongtong [CN/US]; 8049 NE 28th Street, Medina, WA 98039 (US). YUQIU, Jiang [CN/US]; 5001 South 232nd Street, Kent, WA 98032 (US). (74) Agents: MAKI, David, J. et al.; Seed and Berry LLP, Suite 6300, 701 Fifth Avenue, Seattle, WA 98104-7092 (US). </div> <div> (81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). </div> </div> Published <i>Without international search report and to be republished upon receipt of that report.</i>
(54) Title: COMPOUNDS FOR IMMUNOTHERAPY AND DIAGNOSIS OF COLON CANCER AND METHODS FOR THEIR USE		
(57) Abstract <p>Compositions and methods for the therapy and diagnosis of cancer, such as colon cancer, are disclosed. Compositions may comprise one or more colon tumor proteins, immunogenic portions thereof, or polynucleotides that encode such portions. Alternatively, a therapeutic composition may comprise an antigen presenting cell that expresses a colon tumor protein, or a T cell that is specific for cells expressing such a protein. Such compositions may be used, for example, for the prevention and treatment of diseases such as colon cancer. Diagnostic methods based on detecting a colon tumor protein, or mRNA encoding such a protein, in a sample are also provided.</p>		

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COMPOUNDS FOR IMMUNOTHERAPY AND DIAGNOSIS OF COLON CANCER AND METHODS FOR THEIR USE

TECHNICAL FIELD

5 The present invention relates generally to therapy and diagnosis of cancer, such as colon cancer. The invention is more specifically related to polypeptides comprising at least a portion of a colon tumor protein, and to polynucleotides encoding such polypeptides. Such polypeptides and polynucleotides may be used in vaccines and pharmaceutical compositions for prevention and treatment of colon cancer, and for the
10 diagnosis and monitoring of such cancers.

BACKGROUND OF THE INVENTION

 Cancer is a significant health problem throughout the world. Although advances have been made in detection and therapy of cancer, no vaccine or other universally successful method for prevention or treatment is currently available. Current therapies, which
15 are generally based on a combination of chemotherapy or surgery and radiation, continue to prove inadequate in many patients.

 Colon cancer is the second most frequently diagnosed malignancy in the United States as well as the second most common cause of cancer death. An estimated 95,600 new cases of colon cancer will be diagnosed in 1998, with an estimated 47,700 deaths.
20 The five-year survival rate for patients with colorectal cancer detected in an early localized stage is 92%; unfortunately, only 37% of colorectal cancer is diagnosed at this stage. The survival rate drops to 64% if the cancer is allowed to spread to adjacent organs or lymph nodes, and to 7% in patients with distant metastases.

 The prognosis of colon cancer is directly related to the degree of penetration of
25 the tumor through the bowel wall and the presence or absence of nodal involvement, consequently, early detection and treatment are especially important. Currently, diagnosis is aided by the use of screening assays for fecal occult blood, sigmoidoscopy, colonoscopy and double contrast barium enemas. Treatment regimens are determined by the type and stage of the cancer, and include surgery, radiation therapy and/or chemotherapy. Recurrence
30 following surgery (the most common form of therapy) is a major problem and is often the

ultimate cause of death. In spite of considerable research into therapies for the disease, colon cancer remains difficult to diagnose and treat. In spite of considerable research into therapies for these and other cancers, colon cancer remains difficult to diagnose and treat effectively. Accordingly, there is a need in the art for improved methods for detecting and treating such cancers. The present invention fulfills these needs and further provides other related advantages.

SUMMARY OF THE INVENTION

Briefly stated, the present invention provides compositions and methods for the diagnosis and therapy of cancer, such as colon cancer. In one aspect, the present invention provides polypeptides comprising at least a portion of a colon tumor protein, or a variant thereof. Certain portions and other variants are immunogenic, such that the ability of the variant to react with antigen-specific antisera is not substantially diminished. Within certain embodiments, the polypeptide comprises a sequence that is encoded by a polynucleotide sequence selected from the group consisting of: (a) sequences recited in SEQ ID NO: 1-121, 123-197 and 205-486; (b) variants of a sequence recited in SEQ ID NO: 1-121, 123-197 and 205-486; and (c) complements of a sequence of (a) or (b).

The present invention further provides polynucleotides that encode a polypeptide as described above, or a portion thereof (such as a portion encoding at least 15 amino acid residues of a colon tumor protein), expression vectors comprising such polynucleotides and host cells transformed or transfected with such expression vectors.

Within other aspects, the present invention provides pharmaceutical compositions comprising a polypeptide or polynucleotide as described above and a physiologically acceptable carrier.

Within a related aspect of the present invention, vaccines are provided. Such vaccines comprise a polypeptide or polynucleotide as described above and an immunostimulant.

The present invention further provides pharmaceutical compositions that comprise: (a) an antibody or antigen-binding fragment thereof that specifically binds to a colon tumor protein; and (b) a physiologically acceptable carrier.

Within further aspects, the present invention provides pharmaceutical compositions comprising: (a) an antigen presenting cell that expresses a polypeptide as described above and (b) a pharmaceutically acceptable carrier or excipient. Antigen presenting cells include dendritic cells, macrophages, monocytes, fibroblasts and B cells.

5 Within related aspects, vaccines are provided that comprise: (a) an antigen presenting cell that expresses a polypeptide as described above and (b) an immunostimulant.

The present invention further provides, in other aspects, fusion proteins that comprise at least one polypeptide as described above, as well as polynucleotides encoding such fusion proteins.

10 Within related aspects, pharmaceutical compositions comprising a fusion protein, or a polynucleotide encoding a fusion protein, in combination with a physiologically acceptable carrier are provided.

Vaccines are further provided, within other aspects, that comprise a fusion protein, or a polynucleotide encoding a fusion protein, in combination with an
15 immunostimulant.

Within further aspects, the present invention provides methods for inhibiting the development of a cancer in a patient, comprising administering to a patient a pharmaceutical composition or vaccine as recited above.

The present invention further provides, within other aspects, methods for
20 removing tumor cells from a biological sample, comprising contacting a biological sample with T cells that specifically react with a colon tumor protein, wherein the step of contacting is performed under conditions and for a time sufficient to permit the removal of cells expressing the protein from the sample.

Within related aspects, methods are provided for inhibiting the development of
25 a cancer in a patient, comprising administering to a patient a biological sample treated as described above.

Methods are further provided, within other aspects, for stimulating and/or expanding T cells specific for a colon tumor protein, comprising contacting T cells with one or more of: (i) a polypeptide as described above; (ii) a polynucleotide encoding such a
30 polypeptide; and/or (iii) an antigen presenting cell that expresses such a polypeptide; under

conditions and for a time sufficient to permit the stimulation and/or expansion of T cells. Isolated T cell populations comprising T cells prepared as described above are also provided.

Within further aspects, the present invention provides methods for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective
5 amount of a T cell population as described above.

The present invention further provides methods for inhibiting the development of a cancer in a patient, comprising the steps of: (a) incubating CD4⁺ and/or CD8⁺ T cells isolated from a patient with one or more of: (i) a polypeptide comprising at least an immunogenic portion of a colon tumor protein; (ii) a polynucleotide encoding such a
10 polypeptide; and (iii) an antigen-presenting cell that expresses such a polypeptide; and (b) administering to the patient an effective amount of the proliferated T cells, and thereby inhibiting the development of a cancer in the patient. Proliferated cells may, but need not, be cloned prior to administration to the patient.

Within further aspects, the present invention provides methods for determining
15 the presence or absence of a cancer in a patient, comprising: (a) contacting a biological sample obtained from a patient with a binding agent that binds to a polypeptide as recited above; (b) detecting in the sample an amount of polypeptide that binds to the binding agent; and (c) comparing the amount of polypeptide with a predetermined cut-off value, and therefrom determining the presence or absence of a cancer in the patient. Within preferred
20 embodiments, the binding agent is an antibody, more preferably a monoclonal antibody. The cancer may be colon cancer.

The present invention also provides, within other aspects, methods for monitoring the progression of a cancer in a patient. Such methods comprise the steps of: (a) contacting a biological sample obtained from a patient at a first point in time with a binding
25 agent that binds to a polypeptide as recited above; (b) detecting in the sample an amount of polypeptide that binds to the binding agent; (c) repeating steps (a) and (b) using a biological sample obtained from the patient at a subsequent point in time; and (d) comparing the amount of polypeptide detected in step (c) with the amount detected in step (b) and therefrom monitoring the progression of the cancer in the patient.

30 The present invention further provides, within other aspects, methods for determining the presence or absence of a cancer in a patient, comprising the steps of: (a)

contacting a biological sample obtained from a patient with an oligonucleotide that hybridizes to a polynucleotide that encodes a colon tumor protein; (b) detecting in the sample a level of a polynucleotide, preferably mRNA, that hybridizes to the oligonucleotide; and (c) comparing the level of polynucleotide that hybridizes to the oligonucleotide with a predetermined cut-off value, and therefrom determining the presence or absence of a cancer in the patient. Within certain embodiments, the amount of mRNA is detected via polymerase chain reaction using, for example, at least one oligonucleotide primer that hybridizes to a polynucleotide encoding a polypeptide as recited above, or a complement of such a polynucleotide. Within other embodiments, the amount of mRNA is detected using a hybridization technique, employing an oligonucleotide probe that hybridizes to a polynucleotide that encodes a polypeptide as recited above, or a complement of such a polynucleotide.

In related aspects, methods are provided for monitoring the progression of a cancer in a patient, comprising the steps of: (a) contacting a biological sample obtained from a patient with an oligonucleotide that hybridizes to a polynucleotide that encodes a colon tumor protein; (b) detecting in the sample an amount of a polynucleotide that hybridizes to the oligonucleotide; (c) repeating steps (a) and (b) using a biological sample obtained from the patient at a subsequent point in time; and (d) comparing the amount of polynucleotide detected in step (c) with the amount detected in step (b) and therefrom monitoring the progression of the cancer in the patient.

Within further aspects, the present invention provides antibodies, such as monoclonal antibodies, that bind to a polypeptide as described above, as well as diagnostic kits comprising such antibodies. Diagnostic kits comprising one or more oligonucleotide probes or primers as described above are also provided.

These and other aspects of the present invention will become apparent upon reference to the following detailed description and attached figures. All references disclosed herein are hereby incorporated by reference in their entirety as if each was incorporated individually.

SEQUENCE IDENTIFIERS

SEQ ID NO: 1 is a first determined cDNA sequence for Contig 1, showing homology to Neutrophil Gelatinase Associated Lipocalin.

SEQ ID NO: 2 is the determined cDNA sequence for Contig 2, showing no significant homology to any known genes.

SEQ ID NO: 3 is the determined cDNA sequence for Contig 4, showing homology to Carcinoembryonic antigen.

5 SEQ ID NO: 4 is the determined cDNA sequence for Contig 5, showing homology to Carcinoembryonic antigen.

SEQ ID NO: 5 is the determined cDNA sequence for Contig 9, showing homology to Carcinoembryonic antigen.

10 SEQ ID NO: 6 is the determined cDNA sequence for Contig 52, showing homology to Carcinoembryonic antigen.

SEQ ID NO: 7 is the determined cDNA sequence for Contig 6, showing homology to Villin.

SEQ ID NO: 8 is the determined cDNA sequence for Contig 8, showing no significant homology to any known genes.

15 SEQ ID NO: 9 is the determined cDNA sequence for Contig 10, showing homology to Transforming Growth Factor (BIGH3).

SEQ ID NO: 10 is the determined cDNA sequence for Contig 19, showing homology to Transforming Growth Factor (BIGH3).

20 SEQ ID NO: 11 is the determined cDNA sequence for Contig 21, showing homology to Transforming Growth Factor (BIGH3).

SEQ ID NO: 12 is the determined cDNA sequence for Contig 11, showing homology to CO-029.

SEQ ID NO: 13 is the determined cDNA sequence for Contig 55, showing homology to CO-029.

25 SEQ ID NO: 14 is the determined cDNA sequence for Contig 12, showing homology to Chromosome 17, clone hRPC.1171_I_10, also referred to as C798P.

SEQ ID NO: 15 is the determined cDNA sequence for Contig 13, showing no significant homology to any known gene.

30 SEQ ID NO: 16 is the determined cDNA sequence for Contig 14, also referred to as 14261, showing no significant homology to any known gene.

SEQ ID NO: 17 is the determined cDNA sequence for Contig 15, showing homology to Ets-Related Transcription Factor (ERT).

SEQ ID NO: 18 is the determined cDNA sequence for Contig 16, showing homology to Chromosome 5, PAC clone 228g9 (LBNL H142).

5 SEQ ID NO: 19 is the determined cDNA sequence for Contig 24, showing homology to Chromosome 5, PAC clone 228g9 (LBNL H142).

SEQ ID NO: 20 is the determined cDNA sequence for Contig 17, showing homology to Cytokeratin.

10 SEQ ID NO: 21 is the determined cDNA sequence for Contig 18, showing homology to L1-Cadherin.

SEQ ID NO: 22 is the determined cDNA sequence for Contig 20, showing no significant homology to any known gene.

SEQ ID NO: 23 is the determined cDNA sequence for Contig 22, showing homology to Bumetanide-sensitive Na-K-Cl cotransporter (NKCC1).

15 SEQ ID NO: 24 is the determined cDNA sequence for Contig 23, showing no significant homology to any known gene.

SEQ ID NO: 25 is the determined cDNA sequence for Contig 25, showing homology to Macrophage Inflammatory Protein 3 alpha.

20 SEQ ID NO: 26 is the determined cDNA sequence for Contig 26, showing homology to Laminin.

SEQ ID NO: 27 is the determined cDNA sequence for Contig 48, showing homology to Laminin.

SEQ ID NO: 28 is the determined cDNA sequence for Contig 27, showing homology to Mytobularin (MTM1).

25 SEQ ID NO: 29 is the determined cDNA sequence for Contig 28, showing homology to Chromosome 16 BAC clone CIT987SK-A-363E6.

SEQ ID NO: 30 is the determined cDNA sequence for Contig 29, also referred to as C751P and 14247, showing no significant homology to any known gene, but partial homology to Rat GSK-3 β -interacting protein Axil homolog.

30 SEQ ID NO: 31 is the determined cDNA sequence for Contig 30, showing homology to Zinc Finger Transcription Factor (ZNF207).

SEQ ID NO: 32 is the determined cDNA sequence for Contig 31, showing no significant homology to any known gene, but partial homology to Mus musculus GOB-4 homolog.

5 SEQ ID NO: 33 is the determined cDNA sequence for Contig 35, showing no significant homology to any known gene, but partial homology to Mus musculus GOB-4 homolog.

SEQ ID NO: 34 is the determined cDNA sequence for Contig 32, showing no significant homology to any known gene.

10 SEQ ID NO: 35 is the determined cDNA sequence for Contig 34, showing homology to Desmoglein 2.

SEQ ID NO: 36 is the determined cDNA sequence for Contig 36, showing no significant homology to any known gene.

SEQ ID NO: 37 is the determined cDNA sequence for Contig 37, showing homology to Putative Transmembrane Protein.

15 SEQ ID NO: 38 is the determined cDNA sequence for Contig 38, also referred to as C796P and 14219, showing no significant homology to any known gene.

SEQ ID NO: 39 is the determined cDNA sequence for Contig 40, showing homology to Nonspecific Cross-reacting Antigen.

20 SEQ ID NO: 40 is the determined cDNA sequence for Contig 41, also referred to as C799P and 14308, showing no significant homology to any known gene.

SEQ ID NO: 41 is the determined cDNA sequence for Contig 42, also referred to as C794P and 14309, showing no significant homology to any known gene.

SEQ ID NO: 42 is the determined cDNA sequence for Contig 43, showing homology to Chromosome 1 specific transcript KIAA0487.

25 SEQ ID NO: 43 is the determined cDNA sequence for Contig 45, showing homology to hMCM2.

SEQ ID NO: 44 is the determined cDNA sequence for Contig 46, showing homology to ETS2.

30 SEQ ID NO: 45 is the determined cDNA sequence for Contig 49, showing homology to Pump-1.

SEQ ID NO: 46 is the determined cDNA sequence for Contig 50, also referred to as C792P and 18323, showing no significant homology to any known gene.

SEQ ID NO: 47 is the determined cDNA sequence for Contig 51, also referred to as C795P and 14317, showing no significant homology to any known gene.

5 SEQ ID NO: 48 is the determined cDNA sequence for 11092, showing no significant homology to any known gene.

SEQ ID NO: 49 is the determined cDNA sequence for 11093, showing no significant homology to any known gene.

10 SEQ ID NO: 50 is the determined cDNA sequence for 11094, showing homology to Human Putative Enterocyte Differentiation Protein.

SEQ ID NO: 51 is the determined cDNA sequence for 11095, showing homology to Human Transcriptional Corepressor hKAP1/TIF1B mRNA.

SEQ ID NO: 52 is the determined cDNA sequence for 11096, showing no significant homology to any known gene.

15 SEQ ID NO: 53 is the determined cDNA sequence for 11097, showing homology to Human Nonspecific Antigen.

SEQ ID NO: 54 is the determined cDNA sequence for 11098, showing no significant homology to any known gene.

20 SEQ ID NO: 55 is the determined cDNA sequence for 11099, showing homology to Human Pancreatic Secretory Inhibitor (PST) mRNA.

SEQ ID NO: 56 is the determined cDNA sequence for 11186, showing homology to Human Pancreatic Secretory Inhibitor (PST) mRNA.

SEQ ID NO: 57 is the determined cDNA sequence for 11101, showing homology to Human Chromosome X.

25 SEQ ID NO: 58 is the determined cDNA sequence for 11102, showing homology to Human Chromosome X.

SEQ ID NO: 59 is the determined cDNA sequence for 11103, showing no significant homology to any known gene.

30 SEQ ID NO: 60 is the determined cDNA sequence for 11174, showing no significant homology to any known gene.

SEQ ID NO: 61 is the determined cDNA sequence for 11104, showing homology to Human mRNA for KIAA0154.

SEQ ID NO: 62 is the determined cDNA sequence for 11105, showing homology to Human Apurinic/Apyrimidinic Endonuclease (hap1)mRNA.

5 SEQ ID NO: 63 is the determined cDNA sequence for 11106, showing homology to Human Chromosome 12p13.

SEQ ID NO: 64 is the determined cDNA sequence for 11107, showing homology to Human 90 kDa Heat Shock Protein.

10 SEQ ID NO: 65 is the determined cDNA sequence for 11108, showing no significant homology to any known gene.

SEQ ID NO: 66 is the determined cDNA sequence for 11112, showing no significant homology to any known gene.

SEQ ID NO: 67 is the determined cDNA sequence for 11115, showing no significant homology to any known gene.

15 SEQ ID NO: 68 is the determined cDNA sequence for 11117, showing no significant homology to any known gene.

SEQ ID NO: 69 is the determined cDNA sequence for 11118, showing no significant homology to any known gene.

20 SEQ ID NO: 70 is the determined cDNA sequence for 11119, showing homology to Human Elongation Factor 1-alpha.

SEQ ID NO: 71 is the determined cDNA sequence for 11121, showing homology to Human Lamin B Receptor (LBR) mRNA.

SEQ ID NO: 72 is the determined cDNA sequence for 11122, showing homology to H. sapiens mRNA for Novel Glucocorticoid.

25 SEQ ID NO: 73 is the determined cDNA sequence for 11123, showing homology to H. sapiens mRNA for snRNP protein B.

SEQ ID NO: 74 is the determined cDNA sequence for 11124, showing homology to Human Cisplatin Resistance Associated Beta-protein.

30 SEQ ID NO: 75 is the determined cDNA sequence for 11127, showing homology to M. musculus Calumenin mRNA.

SEQ ID NO: 76 is the determined cDNA sequence for 11128, showing homology to Human ras-related small GTP binding protein.

SEQ ID NO: 77 is the determined cDNA sequence for 11130, showing homology to Human Cosmid U169d2.

5 SEQ ID NO: 78 is the determined cDNA sequence for 11131, showing homology to H. sapiens mRNA for protein homologous to Elongation 1-g.

SEQ ID NO: 79 is the determined cDNA sequence for 11134, showing no significant homology to any known gene.

10 SEQ ID NO: 80 is the determined cDNA sequence for 11135, showing homology to H. sapiens Nieman-Pick (NPC1) mRNA.

SEQ ID NO: 81 is the determined cDNA sequence for 11137, showing homology to H. sapiens mRNA for Niecin b-chain.

SEQ ID NO: 82 is the determined cDNA sequence for 11138, showing homology to Human Endogenous Retroviral Protease mRNA.

15 SEQ ID NO: 83 is the determined cDNA sequence for 11139, showing homology to H. sapiens mRNA for DMBT1 protein.

SEQ ID NO: 84 is the determined cDNA sequence for 11140, showing homology to H. sapiens ras GTPase activating-like protein.

20 SEQ ID NO: 85 is the determined cDNA sequence for 11143, showing homology to Human Acidic Ribosomal Phosphoprotein PO mRNA.

SEQ ID NO: 86 is the determined cDNA sequence for 11144, showing homology to H. sapiens U21 mRNA.

SEQ ID NO: 87 is the determined cDNA sequence for 11145, showing homology to Human GTP-binding protein.

25 SEQ ID NO: 88 is the determined cDNA sequence for 11148, showing homology to H. sapiens U21 mRNA.

SEQ ID NO: 89 is the determined cDNA sequence for 11151, showing no significant homology to any known gene.

30 SEQ ID NO: 90 is the determined cDNA sequence for 11154, showing no significant homology to any known gene.

SEQ ID NO: 91 is the determined cDNA sequence for 11156, showing homology to H. sapiens Ribosomal Protein L27.

SEQ ID NO: 92 is the determined cDNA sequence for 11157, showing homology to H. sapiens Ribosomal Protein L27.

5 SEQ ID NO: 93 is the determined cDNA sequence for 11158, showing no significant homology to any known gene.

SEQ ID NO: 94 is the determined cDNA sequence for 11162, showing homology to Ag-X antigen.

10 SEQ ID NO: 95 is the determined cDNA sequence for 11164, showing homology to H. sapiens mRNA for Signal Recognition Protein sub14.

SEQ ID NO: 96 is the determined cDNA sequence for 11165, showing homology to Human PAC 204e5/127h14.

SEQ ID NO: 97 is the determined cDNA sequence for 11166, showing homology to Human mRNA for KIAA0108.

15 SEQ ID NO: 98 is the determined cDNA sequence for 11167, showing homology to H. sapiens mRNA for Neutrophil Gelatinase asst. Lipocalin.

SEQ ID NO: 99 is the determined cDNA sequence for 11168, showing no significant homology to any known gene.

20 SEQ ID NO: 100 is the determined cDNA sequence for 11172, showing no significant homology to any known gene.

SEQ ID NO: 101 is the determined cDNA sequence for 11175, showing no significant homology to any known gene.

SEQ ID NO: 102 is the determined cDNA sequence for 11176, showing homology to Human maspin mRNA.

25 SEQ ID NO: 103 is the determined cDNA sequence for 11177, showing homology to Human Carcinoembryonic Antigen.

SEQ ID NO: 104 is the determined cDNA sequence for 11178, showing homology to Human A-Tubulin mRNA.

30 SEQ ID NO: 105 is the determined cDNA sequence for 11179, showing homology to Human mRNA for proton-ATPase-like protein.

SEQ ID NO: 106 is the determined cDNA sequence for 11180, showing homology to Human HepG2 3' region cDNA clone hmd.

SEQ ID NO: 107 is the determined cDNA sequence for 11182, showing homology to Human MHC homologous to Chicken B-Complex Protein.

5 SEQ ID NO: 108 is the determined cDNA sequence for 11183, showing homology to Human High Mobility Group Box (SSRP1) mRNA.

SEQ ID NO: 109 is the determined cDNA sequence for 11184, showing no significant homology to any known gene.

10 SEQ ID NO: 110 is the determined cDNA sequence for 11185, showing no significant homology to any known gene.

SEQ ID NO: 111 is the determined cDNA sequence for 11187, showing no significant homology to any known gene.

SEQ ID NO: 112 is the determined cDNA sequence for 11190, showing homology to Human Replication Protein A 70kDa.

15 SEQ ID NO: 113 is the determined cDNA sequence for Contig 47, also referred to as C797P, showing homology to Human Chromosome X clone bWXD342.

SEQ ID NO: 114 is the determined cDNA sequence for Contig 7, showing homology to Equilibrative Nucleoside Transporter 2 (ent2).

20 SEQ ID NO: 115 is the determined cDNA sequence for 14235.1, also referred to as C791P, showing homology to H. sapiens chromosome 21 derived BAC containing ets-2 gene.

SEQ ID NO: 116 is the determined cDNA sequence for 14287.2, showing no significant homology to any known gene, but some degree of homology to Putative Transmembrane Protein.

25 SEQ ID NO: 117 is the determined cDNA sequence for 14233.1, also referred to as Contig 48, showing no significant homology to any known gene.

SEQ ID NO: 118 is the determined cDNA sequence for 14298.2, also referred to as C793P, showing no significant homology to any known gene.

30 SEQ ID NO: 119 is the determined cDNA sequence for 14372, also referred to as Contig 44, showing no significant homology to any known gene.

SEQ ID NO: 120 is the determined cDNA sequence for 14295, showing homology to secreted cement gland protein XAG-2 homolog.

SEQ ID NO: 121 is the determined full-length cDNA sequence for a clone showing homology to Beta IG-H3.

5 SEQ ID NO: 122 is the predicted amino acid sequence for the clone of SEQ ID NO: 121.

SEQ ID NO: 123 is a longer determined cDNA sequence for C751P.

SEQ ID NO: 124 is a longer determined cDNA sequence for C791P.

SEQ ID NO: 125 is a longer determined cDNA sequence for C792P.

10 SEQ ID NO: 126 is a longer determined cDNA sequence for C793P.

SEQ ID NO: 127 is a longer determined cDNA sequence for C794P.

SEQ ID NO: 128 is a longer determined cDNA sequence for C795P.

SEQ ID NO: 129 is a longer determined cDNA sequence for C796P.

SEQ ID NO: 130 is a longer determined cDNA sequence for C797P.

15 SEQ ID NO: 131 is a longer determined cDNA sequence for C798P.

SEQ ID NO: 132 is a longer determined cDNA sequence for C799P.

SEQ ID NO: 133 is a first partial determined cDNA sequence for CoSub-3 (also known as 23569).

20 SEQ ID NO: 134 is a second partial determined cDNA sequence for CoSub-3 (also known as 23569).

SEQ ID NO: 135 is a first partial determined cDNA sequence for CoSub-13 (also known as 23579).

SEQ ID NO: 136 is a second partial determined cDNA sequence for CoSub-13 (also known as 23579).

25 SEQ ID NO: 137 is the determined cDNA sequence for CoSub-17 (also known as 23583).

SEQ ID NO: 138 is the determined cDNA sequence for CoSub-19 (also known as 23585).

30 SEQ ID NO: 139 is the determined cDNA sequence for CoSub-22 (also known as 23714).

SEQ ID NO: 140 is the determined cDNA sequence for CoSub-23 (also known as 23715).

SEQ ID NO: 141 is the determined cDNA sequence for CoSub-26 (also known as 23717).

5 SEQ ID NO: 142 is the determined cDNA sequence for CoSub-33 (also known as 23724).

SEQ ID NO: 143 is the determined cDNA sequence for CoSub-34 (also known as 23725).

10 SEQ ID NO: 144 is the determined cDNA sequence for CoSub-35 (also known as 23726).

SEQ ID NO: 145 is the determined cDNA sequence for CoSub-37 (also known as 23728).

SEQ ID NO: 146 is the determined cDNA sequence for CoSub-39 (also known as 23730).

15 SEQ ID NO: 147 is the determined cDNA sequence for CoSub-42 (also known as 23766).

SEQ ID NO: 148 is the determined cDNA sequence for CoSub-44 (also known as 23768).

20 SEQ ID NO: 149 is the determined cDNA sequence for CoSub-47 (also known as 23771).

SEQ ID NO: 150 is the determined cDNA sequence for CoSub-54 (also known as 23778).

SEQ ID NO: 151 is the determined cDNA sequence for CoSub-55 (also known as 23779).

25 SEQ ID NO: 152 is the determined cDNA sequence for CT1 (also known as 24099).

SEQ ID NO: 153 is the determined cDNA sequence for CT2 (also known as 24100).

SEQ ID NO: 154 is the determined cDNA sequence for CT3 (also known as 24101).

SEQ ID NO: 155 is the determined cDNA sequence for CT6 (also known as 24104).

SEQ ID NO: 156 is the determined cDNA sequence for CT7 (also known as 24105).

30 SEQ ID NO: 157 is the determined cDNA sequence for CT12 (also known as 24110).

SEQ ID NO: 158 is the determined cDNA sequence for CT13 (also known as 24111).

- SEQ ID NO: 159 is the determined cDNA sequence for CT14 (also known as 24112).
- SEQ ID NO: 160 is the determined cDNA sequence for CT15 (also known as 24113).
- SEQ ID NO: 161 is the determined cDNA sequence for CT17 (also known as 24115).
- SEQ ID NO: 162 is the determined cDNA sequence for CT18 (also known as 24116).
- 5 SEQ ID NO: 163 is the determined cDNA sequence for CT22 (also known as 23848).
- SEQ ID NO: 164 is the determined cDNA sequence for CT24 (also known as 23849).
- SEQ ID NO: 165 is the determined cDNA sequence for CT31 (also known as 23854).
- SEQ ID NO: 166 is the determined cDNA sequence for CT34 (also known as 23856).
- SEQ ID NO: 167 is the determined cDNA sequence for CT37 (also known as 23859).
- 10 SEQ ID NO: 168 is the determined cDNA sequence for CT39 (also known as 23860).
- SEQ ID NO: 169 is the determined cDNA sequence for CT40 (also known as 23861).
- SEQ ID NO: 170 is the determined cDNA sequence for CT51 (also known as 24130).
- SEQ ID NO: 171 is the determined cDNA sequence for CT53 (also known as 24132).
- SEQ ID NO: 172 is the determined cDNA sequence for CT63 (also known as 24595).
- 15 SEQ ID NO: 173 is the determined cDNA sequence for CT88 (also known as 24608).
- SEQ ID NO: 174 is the determined cDNA sequence for CT92 (also known as 24800).
- SEQ ID NO: 175 is the determined cDNA sequence for CT94 (also known as 24802).
- SEQ ID NO: 176 is the determined cDNA sequence for CT102 (also known as 24805).
- 20 SEQ ID NO: 177 is the determined cDNA sequence for CT103 (also known as 24806).
- SEQ ID NO: 178 is the determined cDNA sequence for CT111 (also known as 25520).
- SEQ ID NO: 179 is the determined cDNA sequence for CT118 (also known as 25522).
- 25 SEQ ID NO: 180 is the determined cDNA sequence for CT121 (also known as 25523).
- SEQ ID NO: 181 is the determined cDNA sequence for CT126 (also known as 25527).
- 30 SEQ ID NO: 182 is the determined cDNA sequence for CT135 (also known as 25534).

SEQ ID NO: 183 is the determined cDNA sequence for CT140 (also known as 25537).

SEQ ID NO: 184 is the determined cDNA sequence for CT145 (also known as 25542).

5 SEQ ID NO: 185 is the determined cDNA sequence for CT147 (also known as 25543).

SEQ ID NO: 186 is the determined cDNA sequence for CT148 (also known as 25544).

10 SEQ ID NO: 187 is the determined cDNA sequence for CT502 (also known as 26420).

SEQ ID NO: 188 is the determined cDNA sequence for CT507 (also known as 26425).

SEQ ID NO: 189 is the determined cDNA sequence for CT521 (also known as 27366).

15 SEQ ID NO: 190 is the determined cDNA sequence for CT544 (also known as 27375).

SEQ ID NO: 191 is the determined cDNA sequence for CT577 (also known as 27385).

20 SEQ ID NO: 192 is the determined cDNA sequence for CT580 (also known as 27387).

SEQ ID NO: 193 is the determined cDNA sequence for CT594 (also known as 27540).

SEQ ID NO: 194 is the determined cDNA sequence for CT606 (also known as 27547).

25 SEQ ID NO: 195 is the determined cDNA sequence for CT607 (also known as 27548).

SEQ ID NO: 196 is the determined cDNA sequence for CT599 (also known as 27903).

30 SEQ ID NO: 197 is the determined cDNA sequence for CT632 (also known as 27922).

SEQ ID NO: 198 is the predicted amino acid sequence for CT502 (SEQ ID NO: 187).

SEQ ID NO: 199 is the predicted amino acid sequence for CT507 (SEQ ID NO: 188).
SEQ ID NO: 200 is the predicted amino acid sequence for CT521 (SEQ ID NO: 189).
SEQ ID NO: 201 is the predicted amino acid sequence for CT544 (SEQ ID NO: 190).
SEQ ID NO: 202 is the predicted amino acid sequence for CT606 (SEQ ID NO: 194).
5 SEQ ID NO: 203 is the predicted amino acid sequence for CT607 (SEQ ID NO: 195).
SEQ ID NO: 204 is the predicted amino acid sequence for CT632 (SEQ ID NO: 197).
SEQ ID NO: 205 is the determined cDNA sequence for clone 25244.
SEQ ID NO: 206 is the determined cDNA sequence for clone 25245.
SEQ ID NO: 207 is the determined cDNA sequence for clone 25246.
10 SEQ ID NO: 208 is the determined cDNA sequence for clone 25248.
SEQ ID NO: 209 is the determined cDNA sequence for clone 25249.
SEQ ID NO: 210 is the determined cDNA sequence for clone 25250.
SEQ ID NO: 211 is the determined cDNA sequence for clone 25251.
SEQ ID NO: 212 is the determined cDNA sequence for clone 25252.
15 SEQ ID NO: 213 is the determined cDNA sequence for clone 25253.
SEQ ID NO: 214 is the determined cDNA sequence for clone 25254.
SEQ ID NO: 215 is the determined cDNA sequence for clone 25255.
SEQ ID NO: 216 is the determined cDNA sequence for clone 25256.
SEQ ID NO: 217 is the determined cDNA sequence for clone 25257.
20 SEQ ID NO: 218 is the determined cDNA sequence for clone 25259.
SEQ ID NO: 219 is the determined cDNA sequence for clone 25260.
SEQ ID NO: 220 is the determined cDNA sequence for clone 25261.
SEQ ID NO: 221 is the determined cDNA sequence for clone 25262.
SEQ ID NO: 222 is the determined cDNA sequence for clone 25263.
25 SEQ ID NO: 223 is the determined cDNA sequence for clone 25264.
SEQ ID NO: 224 is the determined cDNA sequence for clone 25265.
SEQ ID NO: 225 is the determined cDNA sequence for clone 25266.
SEQ ID NO: 226 is the determined cDNA sequence for clone 25267.
SEQ ID NO: 227 is the determined cDNA sequence for clone 25268.
30 SEQ ID NO: 228 is the determined cDNA sequence for clone 25269.
SEQ ID NO: 229 is the determined cDNA sequence for clone 25271.

SEQ ID NO: 230 is the determined cDNA sequence for clone 25272.
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5 SEQ ID NO: 234 is the determined cDNA sequence for clone 25276.
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10 SEQ ID NO: 239 is the determined cDNA sequence for clone 25282.
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20 SEQ ID NO: 249 is the determined cDNA sequence for clone 25292.
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SEQ ID NO: 251 is the determined cDNA sequence for clone 25294.
SEQ ID NO: 252 is the determined cDNA sequence for clone 25295.
SEQ ID NO: 253 is the determined cDNA sequence for clone 25296.
25 SEQ ID NO: 254 is the determined cDNA sequence for clone 25297.
SEQ ID NO: 255 is the determined cDNA sequence for clone 25418.
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30 SEQ ID NO: 259 is the determined cDNA sequence for clone 25422.
SEQ ID NO: 260 is the determined cDNA sequence for clone 25423.

SEQ ID NO: 261 is the determined cDNA sequence for clone 25424.
SEQ ID NO: 262 is the determined cDNA sequence for clone 25426.
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SEQ ID NO: 266 is the determined cDNA sequence for clone 25430.
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SEQ ID NO: 269 is the determined cDNA sequence for clone 25433.
10 SEQ ID NO: 270 is the determined cDNA sequence for clone 25434.
SEQ ID NO: 271 is the determined cDNA sequence for clone 25435.
SEQ ID NO: 272 is the determined cDNA sequence for clone 25436.
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SEQ ID NO: 282 is the determined cDNA sequence for clone 25446.
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25 SEQ ID NO: 285 is the determined cDNA sequence for clone 25844.
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30 SEQ ID NO: 290 is the determined cDNA sequence for clone 25850.
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SEQ ID NO: 292 is the determined cDNA sequence for clone 25852.
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5 SEQ ID NO: 296 is the determined cDNA sequence for clone 25856.
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SEQ ID NO: 299 is the determined cDNA sequence for clone 25859.
SEQ ID NO: 300 is the determined cDNA sequence for clone 25860.
10 SEQ ID NO: 301 is the determined cDNA sequence for clone 25861.
SEQ ID NO: 302 is the determined cDNA sequence for clone 25862.
SEQ ID NO: 303 is the determined cDNA sequence for clone 25863.
SEQ ID NO: 304 is the determined cDNA sequence for clone 25864.
SEQ ID NO: 305 is the determined cDNA sequence for clone 25865.
15 SEQ ID NO: 306 is the determined cDNA sequence for clone 25866.
SEQ ID NO: 307 is the determined cDNA sequence for clone 25867.
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SEQ ID NO: 310 is the determined cDNA sequence for clone 25870.
20 SEQ ID NO: 311 is the determined cDNA sequence for clone 25871.
SEQ ID NO: 312 is the determined cDNA sequence for clone 25872.
SEQ ID NO: 313 is the determined cDNA sequence for clone 25873.
SEQ ID NO: 314 is the determined cDNA sequence for clone 25875.
SEQ ID NO: 315 is the determined cDNA sequence for clone 25876.
25 SEQ ID NO: 316 is the determined cDNA sequence for clone 25877.
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30 SEQ ID NO: 321 is the determined cDNA sequence for clone 25882.
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SEQ ID NO: 323 is the determined cDNA sequence for clone 25884.
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5 SEQ ID NO: 327 is the determined cDNA sequence for clone 25888.
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SEQ ID NO: 329 is the determined cDNA sequence for clone 25890.
SEQ ID NO: 330 is the determined cDNA sequence for clone 25892.
SEQ ID NO: 331 is the determined cDNA sequence for clone 25894.
10 SEQ ID NO: 332 is the determined cDNA sequence for clone 25895.
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SEQ ID NO: 334 is the determined cDNA sequence for clone 25897.
SEQ ID NO: 335 is the determined cDNA sequence for clone 25899.
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15 SEQ ID NO: 337 is the determined cDNA sequence for clone 25901.
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SEQ ID NO: 339 is the determined cDNA sequence for clone 25903.
SEQ ID NO: 340 is the determined cDNA sequence for clone 25904.
SEQ ID NO: 341 is the determined cDNA sequence for clone 25906.
20 SEQ ID NO: 342 is the determined cDNA sequence for clone 25907.
SEQ ID NO: 343 is the determined cDNA sequence for clone 25908.
SEQ ID NO: 344 is the determined cDNA sequence for clone 25909.
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SEQ ID NO: 346 is the determined cDNA sequence for clone 25911.
25 SEQ ID NO: 347 is the determined cDNA sequence for clone 25912.
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SEQ ID NO: 349 is the determined cDNA sequence for clone 25914.
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30 SEQ ID NO: 352 is the determined cDNA sequence for clone 25917.
SEQ ID NO: 353 is the determined cDNA sequence for clone 25918.

SEQ ID NO: 354 is the determined cDNA sequence for clone 25919.
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5 SEQ ID NO: 358 is the determined cDNA sequence for clone 25924.
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10 SEQ ID NO: 363 is the determined cDNA sequence for clone 25929.
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25 SEQ ID NO: 378 is the determined cDNA sequence for clone 31952.
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15 SEQ ID NO: 399 is the determined cDNA sequence for clone 32012.
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SEQ ID NO: 405 is the determined cDNA sequence for clone 32022.
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SEQ ID NO: 407 is the determined cDNA sequence for clone 31963.
SEQ ID NO: 408 is the determined cDNA sequence for clone 31989.
25 SEQ ID NO: 409 is the determined cDNA sequence for clone 32015.
SEQ ID NO: 410 is the determined cDNA sequence for clone 32002.
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30 SEQ ID NO: 414 is the determined cDNA sequence for clone 32007.
SEQ ID NO: 415 is the determined cDNA sequence for clone 31965.

SEQ ID NO: 416 is the determined cDNA sequence for clone 31935.
SEQ ID NO: 417 is the determined cDNA sequence for clone 32008.
SEQ ID NO: 418 is the determined cDNA sequence for clone 31966.
SEQ ID NO: 419 is the determined cDNA sequence for clone 32020.
5 SEQ ID NO: 420 is the determined cDNA sequence for clone 31971.
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10 SEQ ID NO: 425 is the determined cDNA sequence for clone 32006.
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SEQ ID NO: 434 is the determined cDNA sequence for clone 31996.
20 SEQ ID NO: 435 is the determined cDNA sequence for clone 32010.
SEQ ID NO: 436 is the determined cDNA sequence for clone 31974.
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25 SEQ ID NO: 440 is the determined cDNA sequence for clone 31947.
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SEQ ID NO: 444 is the determined cDNA sequence for clone 31984.
30 SEQ ID NO: 445 is the determined cDNA sequence for clone 32024.
SEQ ID NO: 446 is the determined cDNA sequence for clone 31972.

SEQ ID NO: 447 is the determined cDNA sequence for clone 31943.
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SEQ ID NO: 450 is the determined cDNA sequence for clone 32009.
5 SEQ ID NO: 451 is the determined cDNA sequence for clone 32019.
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SEQ ID NO: 454 is the determined cDNA sequence for clone 31968.
SEQ ID NO: 455 is the determined cDNA sequence for clone 31955.
10 SEQ ID NO: 456 is the determined cDNA sequence for clone 31951.
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SEQ ID NO: 459 is the determined cDNA sequence for clone 32001.
SEQ ID NO: 460 is the determined cDNA sequence for clone 31953.
15 SEQ ID NO: 461 is the determined cDNA sequence for clone 31944.
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SEQ ID NO: 463 is the determined cDNA sequence for clone 31828.
SEQ ID NO: 464 is the determined cDNA sequence for clone 31830.
SEQ ID NO: 465 is the determined cDNA sequence for clone 31841.
20 SEQ ID NO: 466 is the determined cDNA sequence for clone 31847.
SEQ ID NO: 467 is the determined cDNA sequence for clone 31850.
SEQ ID NO: 468 is the determined cDNA sequence for clone 31852.
SEQ ID NO: 469 is the determined cDNA sequence for clone 31855.
SEQ ID NO: 470 is the determined cDNA sequence for clone 31858.
25 SEQ ID NO: 471 is the determined cDNA sequence for clone 31861.
SEQ ID NO: 472 is the determined cDNA sequence for clone 31868.
SEQ ID NO: 473 is the determined cDNA sequence for clone 31870.
SEQ ID NO: 474 is the determined cDNA sequence for clone 31872.
SEQ ID NO: 475 is the determined cDNA sequence for clone 31873.
30 SEQ ID NO: 476 is the determined cDNA sequence for clone 31877.
SEQ ID NO: 477 is the determined cDNA sequence for clone 31878.

SEQ ID NO: 478 is the determined cDNA sequence for clone 31885.

SEQ ID NO: 479 is the determined cDNA sequence for clone 31888.

SEQ ID NO: 480 is the determined cDNA sequence for clone 31890.

SEQ ID NO: 481 is the determined cDNA sequence for clone 31893.

5 SEQ ID NO: 482 is the determined cDNA sequence for clone 31898.

SEQ ID NO: 483 is the determined cDNA sequence for clone 31901.

SEQ ID NO: 484 is the determined cDNA sequence for clone 31909.

SEQ ID NO: 485 is the determined cDNA sequence for clone 31910.

SEQ ID NO: 486 is the determined cDNA sequence for clone 31914.

10

DETAILED DESCRIPTION OF THE INVENTION

As noted above, the present invention is generally directed to compositions and methods for the therapy and diagnosis of cancer, such as colon cancer. The compositions described herein may include colon tumor polypeptides, polynucleotides encoding such polypeptides, binding agents such as antibodies, antigen presenting cells (APCs) and/or immune system cells (*e.g.*, T cells). Polypeptides of the present invention generally comprise at least a portion (such as an immunogenic portion) of a colon tumor protein or a variant thereof. A "colon tumor protein" is a protein that is expressed in colon tumor cells at a level that is at least two fold, and preferably at least five fold, greater than the level of expression in a normal tissue, as determined using a representative assay provided herein. Certain colon tumor proteins are tumor proteins that react detectably (within an immunoassay, such as an ELISA or Western blot) with antisera of a patient afflicted with colon cancer. Polynucleotides of the subject invention generally comprise a DNA or RNA sequence that encodes all or a portion of such a polypeptide, or that is complementary to such a sequence. Antibodies are generally immune system proteins, or antigen-binding fragments thereof, that are capable of binding to a polypeptide as described above. Antigen presenting cells include dendritic cells, macrophages, monocytes, fibroblasts and B-cells that express a polypeptide as described above. T cells that may be employed within such compositions are generally T cells that are specific for a polypeptide as described above.

The present invention is based on the discovery of human colon tumor proteins. Sequences of polynucleotides encoding specific tumor proteins are provided in SEQ ID NO: 1-121, 123-197 and 205-486.

5 COLON TUMOR PROTEIN POLYNUCLEOTIDES

Any polynucleotide that encodes a colon tumor protein or a portion or other variant thereof as described herein is encompassed by the present invention. Preferred polynucleotides comprise at least 15 consecutive nucleotides, preferably at least 30 consecutive nucleotides and more preferably at least 45 consecutive nucleotides, that encode
10 a portion of a colon tumor protein. More preferably, a polynucleotide encodes an immunogenic portion of a colon tumor protein. Polynucleotides complementary to any such sequences are also encompassed by the present invention. Polynucleotides may be single-stranded (coding or antisense) or double-stranded, and may be DNA (genomic, cDNA or synthetic) or RNA molecules. RNA molecules include HnRNA molecules, which contain
15 introns and correspond to a DNA molecule in a one-to-one manner, and mRNA molecules, which do not contain introns. Additional coding or non-coding sequences may, but need not, be present within a polynucleotide of the present invention, and a polynucleotide may, but need not, be linked to other molecules and/or support materials.

Polynucleotides may comprise a native sequence (*i.e.*, an endogenous
20 sequence that encodes a colon tumor protein or a portion thereof) or may comprise a variant of such a sequence. Polynucleotide variants may contain one or more substitutions, additions, deletions and/or insertions such that the immunogenicity of the encoded polypeptide is not diminished, relative to a native tumor protein. The effect on the immunogenicity of the encoded polypeptide may generally be assessed as described herein.
25 Variants preferably exhibit at least about 70% identity, more preferably at least about 80% identity and most preferably at least about 90% identity to a polynucleotide sequence that encodes a native colon tumor protein or a portion thereof.

Two polynucleotide or polypeptide sequences are said to be "identical" if the sequence of nucleotides or amino acids in the two sequences is the same when aligned for
30 maximum correspondence as described below. Comparisons between two sequences are typically performed by comparing the sequences over a comparison window to identify and

compare local regions of sequence similarity. A “comparison window” as used herein, refers to a segment of at least about 20 contiguous positions, usually 30 to about 75, in which a sequence may be compared to a reference sequence of the same number of contiguous positions after the two sequences are optimally aligned.

5 Optimal alignment of sequences for comparison may be conducted using the Megalign program in the Lasergene suite of bioinformatics software (DNASTAR, Inc., Madison, WI), using default parameters. This program embodies several alignment schemes described in the following references: Dayhoff, M.O. (1978) A model of evolutionary change in proteins – Matrices for detecting distant relationships. In Dayhoff, M.O. (ed.) Atlas of
10 Protein Sequence and Structure, National Biomedical Research Foundation, Washington DC Vol. 5, Suppl. 3, pp. 345-358; Hein J. (1990) Unified Approach to Alignment and Phylogenesis pp. 626-645 *Methods in Enzymology* vol. 183, Academic Press, Inc., San Diego, CA; Higgins, D.G. and Sharp, P.M. (1989) *CABIOS* 5:151-153; Myers, E.W. and Muller W. (1988) *CABIOS* 4:11-17; Robinson, E.D. (1971) *Comb. Theor* 11:105; Santou, N. Nes, M.
15 (1987) *Mol. Biol. Evol.* 4:406-425; Sneath, P.H.A. and Sokal, R.R. (1973) *Numerical Taxonomy – the Principles and Practice of Numerical Taxonomy*, Freeman Press, San Francisco, CA; Wilbur, W.J. and Lipman, D.J. (1983) *Proc. Natl. Acad. Sci. USA* 80:726-730.

 Preferably, the “percentage of sequence identity” is determined by comparing
20 two optimally aligned sequences over a window of comparison of at least 20 positions, wherein the portion of the polynucleotide or polypeptide sequence in the comparison window may comprise additions or deletions (i.e. gaps) of 20 percent or less, usually 5 to 15 percent, or 10 to 12 percent, as compared to the reference sequence (which does not comprise additions or deletions) for optimal alignment of the two sequences. The percentage is
25 calculated by determining the number of positions at which the identical nucleic acid bases or amino acid residue occurs in both sequences to yield the number of matched positions, dividing the number of matched positions by the total number of positions in the reference sequence (i.e. the window size) and multiplying the results by 100 to yield the percentage of sequence identity.

30 Variants may also, or alternatively, be substantially homologous to a native gene, or a portion or complement thereof. Such polynucleotide variants are capable of

hybridizing under moderately stringent conditions to a naturally occurring DNA sequence encoding a native colon tumor protein (or a complementary sequence). Suitable moderately stringent conditions include prewashing in a solution of 5 X SSC, 0.5% SDS, 1.0 mM EDTA (pH 8.0); hybridizing at 50°C-65°C, 5 X SSC, overnight; followed by washing twice at 65°C
5 for 20 minutes with each of 2X, 0.5X and 0.2X SSC containing 0.1% SDS.

It will be appreciated by those of ordinary skill in the art that, as a result of the degeneracy of the genetic code, there are many nucleotide sequences that encode a polypeptide as described herein. Some of these polynucleotides bear minimal homology to the nucleotide sequence of any native gene. Nonetheless, polynucleotides that vary due to
10 differences in codon usage are specifically contemplated by the present invention. Further, alleles of the genes comprising the polynucleotide sequences provided herein are within the scope of the present invention. Alleles are endogenous genes that are altered as a result of one or more mutations, such as deletions, additions and/or substitutions of nucleotides. The resulting mRNA and protein may, but need not, have an altered structure or function. Alleles
15 may be identified using standard techniques (such as hybridization, amplification and/or database sequence comparison).

Polynucleotides may be prepared using any of a variety of techniques. For example, a polynucleotide may be identified, as described in more detail below, by screening a microarray of cDNAs for tumor-associated expression (*i.e.*, expression that is at least two
20 fold greater in a colon tumor than in normal tissue, as determined using a representative assay provided herein). Such screens may be performed using a Synteni microarray (Palo Alto, CA) according to the manufacturer's instructions (and essentially as described by Schena et al., *Proc. Natl. Acad. Sci. USA* 93:10614-10619, 1996 and Heller et al., *Proc. Natl. Acad. Sci. USA* 94:2150-2155, 1997). Alternatively, polypeptides may be amplified from cDNA
25 prepared from cells expressing the proteins described herein, such as colon tumor cells. Such polynucleotides may be amplified via polymerase chain reaction (PCR). For this approach, sequence-specific primers may be designed based on the sequences provided herein, and may be purchased or synthesized.

An amplified portion may be used to isolate a full length gene from a suitable
30 library (*e.g.*, a colon tumor cDNA library) using well known techniques. Within such techniques, a library (cDNA or genomic) is screened using one or more polynucleotide

probes or primers suitable for amplification. Preferably, a library is size-selected to include larger molecules. Random primed libraries may also be preferred for identifying 5' and upstream regions of genes. Genomic libraries are preferred for obtaining introns and extending 5' sequences.

5 For hybridization techniques, a partial sequence may be labeled (*e.g.*, by nick-translation or end-labeling with ^{32}P) using well known techniques. A bacterial or bacteriophage library is then screened by hybridizing filters containing denatured bacterial colonies (or lawns containing phage plaques) with the labeled probe (*see* Sambrook et al., *Molecular Cloning: A Laboratory Manual*, Cold Spring Harbor Laboratories, Cold Spring
10 Harbor, NY, 1989). Hybridizing colonies or plaques are selected and expanded, and the DNA is isolated for further analysis. cDNA clones may be analyzed to determine the amount of additional sequence by, for example, PCR using a primer from the partial sequence and a primer from the vector. Restriction maps and partial sequences may be generated to identify one or more overlapping clones. The complete sequence may then be determined using
15 standard techniques, which may involve generating a series of deletion clones. The resulting overlapping sequences are then assembled into a single contiguous sequence. A full length cDNA molecule can be generated by ligating suitable fragments, using well known techniques.

Alternatively, there are numerous amplification techniques for obtaining a full
20 length coding sequence from a partial cDNA sequence. Within such techniques, amplification is generally performed via PCR. Any of a variety of commercially available kits may be used to perform the amplification step. Primers may be designed using, for example, software well known in the art. Primers are preferably 22-30 nucleotides in length, have a GC content of at least 50% and anneal to the target sequence at temperatures of about
25 68°C to 72°C. The amplified region may be sequenced as described above, and overlapping sequences assembled into a contiguous sequence.

One such amplification technique is inverse PCR (*see* Triglia et al., *Nucl. Acids Res.* 16:8186, 1988), which uses restriction enzymes to generate a fragment in the known region of the gene. The fragment is then circularized by intramolecular ligation and
30 used as a template for PCR with divergent primers derived from the known region. Within an alternative approach, sequences adjacent to a partial sequence may be retrieved by

amplification with a primer to a linker sequence and a primer specific to a known region. The amplified sequences are typically subjected to a second round of amplification with the same linker primer and a second primer specific to the known region. A variation on this procedure, which employs two primers that initiate extension in opposite directions from the known sequence, is described in WO 96/38591. Another such technique is known as "rapid amplification of cDNA ends" or RACE. This technique involves the use of an internal primer and an external primer, which hybridizes to a polyA region or vector sequence, to identify sequences that are 5' and 3' of a known sequence. Additional techniques include capture PCR (Lagerstrom et al., *PCR Methods Applic. 1*:111-19, 1991) and walking PCR (Parker et al., *Nucl. Acids Res. 19*:3055-60, 1991). Other methods employing amplification may also be employed to obtain a full length cDNA sequence.

In certain instances, it is possible to obtain a full length cDNA sequence by analysis of sequences provided in an expressed sequence tag (EST) database, such as that available from GenBank. Searches for overlapping ESTs may generally be performed using well known programs (*e.g.*, NCBI BLAST searches), and such ESTs may be used to generate a contiguous full length sequence.

Certain nucleic acid sequences of cDNA molecules encoding portions of colon tumor proteins are provided in SEQ ID NO: 1-121, 123-197 and 205-486. These polynucleotides were isolated from colon tumor cDNA libraries using conventional and/or PCR-based subtraction techniques, as described below.

Polynucleotide variants may generally be prepared by any method known in the art, including chemical synthesis by, for example, solid phase phosphoramidite chemical synthesis. Modifications in a polynucleotide sequence may also be introduced using standard mutagenesis techniques, such as oligonucleotide-directed site-specific mutagenesis (*see* Adelman et al., *DNA 2*:183, 1983). Alternatively, RNA molecules may be generated by *in vitro* or *in vivo* transcription of DNA sequences encoding a colon tumor protein, or portion thereof, provided that the DNA is incorporated into a vector with a suitable RNA polymerase promoter (such as T7 or SP6). Certain portions may be used to prepare an encoded polypeptide, as described herein. In addition, or alternatively, a portion may be administered to a patient such that the encoded polypeptide is generated *in vivo* (*e.g.*, by transfecting

antigen-presenting cells, such as dendritic cells, with a cDNA construct encoding a colon tumor polypeptide, and administering the transfected cells to the patient).

A portion of a sequence complementary to a coding sequence (*i.e.*, an antisense polynucleotide) may also be used as a probe or to modulate gene expression. cDNA constructs that can be transcribed into antisense RNA may also be introduced into cells of tissues to facilitate the production of antisense RNA. An antisense polynucleotide may be used, as described herein, to inhibit expression of a tumor protein. Antisense technology can be used to control gene expression through triple-helix formation, which compromises the ability of the double helix to open sufficiently for the binding of polymerases, transcription factors or regulatory molecules (*see* Gee et al., *In Huber and Carr, Molecular and Immunologic Approaches*, Futura Publishing Co. (Mt. Kisco, NY; 1994)). Alternatively, an antisense molecule may be designed to hybridize with a control region of a gene (*e.g.*, promoter, enhancer or transcription initiation site), and block transcription of the gene; or to block translation by inhibiting binding of a transcript to ribosomes.

A portion of a coding sequence, or of a complementary sequence, may also be designed as a probe or primer to detect gene expression. Probes may be labeled with a variety of reporter groups, such as radionuclides and enzymes, and are preferably at least 10 nucleotides in length, more preferably at least 20 nucleotides in length and still more preferably at least 30 nucleotides in length. Primers, as noted above, are preferably 22-30 nucleotides in length.

Any polynucleotide may be further modified to increase stability *in vivo*. Possible modifications include, but are not limited to, the addition of flanking sequences at the 5' and/or 3' ends; the use of phosphorothioate or 2' O-methyl rather than phosphodiesterase linkages in the backbone; and/or the inclusion of nontraditional bases such as inosine, queosine and wybutosine, as well as acetyl-, methyl-, thio- and other modified forms of adenine, cytidine, guanine, thymine and uridine.

Nucleotide sequences as described herein may be joined to a variety of other nucleotide sequences using established recombinant DNA techniques. For example, a polynucleotide may be cloned into any of a variety of cloning vectors, including plasmids, phagemids, lambda phage derivatives and cosmids. Vectors of particular interest include expression vectors, replication vectors, probe generation vectors and sequencing vectors. In

general, a vector will contain an origin of replication functional in at least one organism, convenient restriction endonuclease sites and one or more selectable markers. Other elements will depend upon the desired use, and will be apparent to those of ordinary skill in the art.

Within certain embodiments, polynucleotides may be formulated so as to
5 permit entry into a cell of a mammal, and expression therein. Such formulations are particularly useful for therapeutic purposes, as described below. Those of ordinary skill in the art will appreciate that there are many ways to achieve expression of a polynucleotide in a target cell, and any suitable method may be employed. For example, a polynucleotide may be incorporated into a viral vector such as, but not limited to, adenovirus, adeno-associated
10 virus, retrovirus, or vaccinia or other pox virus (*e.g.*, avian pox virus). Techniques for incorporating DNA into such vectors are well known to those of ordinary skill in the art. A retroviral vector may additionally transfer or incorporate a gene for a selectable marker (to aid in the identification or selection of transduced cells) and/or a targeting moiety, such as a gene that encodes a ligand for a receptor on a specific target cell, to render the vector target
15 specific. Targeting may also be accomplished using an antibody, by methods known to those of ordinary skill in the art.

Other formulations for therapeutic purposes include colloidal dispersion systems, such as macromolecule complexes, nanocapsules, microspheres, beads, and lipid-based systems including oil-in-water emulsions, micelles, mixed micelles, and liposomes. A
20 preferred colloidal system for use as a delivery vehicle *in vitro* and *in vivo* is a liposome (*i.e.*, an artificial membrane vesicle). The preparation and use of such systems is well known in the art.

COLON TUMOR POLYPEPTIDES

25 Within the context of the present invention, polypeptides may comprise at least an immunogenic portion of a colon tumor protein or a variant thereof, as described herein. As noted above, a "colon tumor protein" is a protein that is expressed by colon tumor cells. Proteins that are colon tumor proteins also react detectably within an immunoassay (such as an ELISA) with antisera from a patient with colon cancer. Polypeptides as described
30 herein may be of any length. Additional sequences derived from the native protein and/or

heterologous sequences may be present, and such sequences may (but need not) possess further immunogenic or antigenic properties.

An "immunogenic portion," as used herein is a portion of a protein that is recognized (*i.e.*, specifically bound) by a B-cell and/or T-cell surface antigen receptor. Such immunogenic portions generally comprise at least 5 amino acid residues, more preferably at least 10, and still more preferably at least 20 amino acid residues of a colon tumor protein or a variant thereof. Certain preferred immunogenic portions include peptides in which an N-terminal leader sequence and/or transmembrane domain have been deleted. Other preferred immunogenic portions may contain a small N- and/or C-terminal deletion (*e.g.*, 1-30 amino acids, preferably 5-15 amino acids), relative to the mature protein.

Immunogenic portions may generally be identified using well known techniques, such as those summarized in Paul, *Fundamental Immunology*, 3rd ed., 243-247 (Raven Press, 1993) and references cited therein. Such techniques include screening polypeptides for the ability to react with antigen-specific antibodies, antisera and/or T-cell lines or clones. As used herein, antisera and antibodies are "antigen-specific" if they specifically bind to an antigen (*i.e.*, they react with the protein in an ELISA or other immunoassay, and do not react detectably with unrelated proteins). Such antisera and antibodies may be prepared as described herein, and using well known techniques. An immunogenic portion of a native colon tumor protein is a portion that reacts with such antisera and/or T-cells at a level that is not substantially less than the reactivity of the full length polypeptide (*e.g.*, in an ELISA and/or T-cell reactivity assay). Such immunogenic portions may react within such assays at a level that is similar to or greater than the reactivity of the full length polypeptide. Such screens may generally be performed using methods well known to those of ordinary skill in the art, such as those described in Harlow and Lane, *Antibodies: A Laboratory Manual*, Cold Spring Harbor Laboratory, 1988. For example, a polypeptide may be immobilized on a solid support and contacted with patient sera to allow binding of antibodies within the sera to the immobilized polypeptide. Unbound sera may then be removed and bound antibodies detected using, for example, ¹²⁵I-labeled Protein A.

As noted above, a composition may comprise a variant of a native colon tumor protein. A polypeptide "variant," as used herein, is a polypeptide that differs from a native colon tumor protein in one or more substitutions, deletions, additions and/or insertions, such

that the immunogenicity of the polypeptide is not substantially diminished. In other words, the ability of a variant to react with antigen-specific antisera may be enhanced or unchanged, relative to the native protein, or may be diminished by less than 50%, and preferably less than 20%, relative to the native protein. Such variants may generally be identified by modifying one of the above polypeptide sequences and evaluating the reactivity of the modified polypeptide with antigen-specific antibodies or antisera as described herein. Preferred variants include those in which one or more portions, such as an N-terminal leader sequence or transmembrane domain, have been removed. Other preferred variants include variants in which a small portion (*e.g.*, 1-30 amino acids, preferably 5-15 amino acids) has been removed from the N- and/or C-terminal of the mature protein.

Polypeptide variants preferably exhibit at least about 70%, more preferably at least about 90% and most preferably at least about 95% identity (determined as described above) to the identified polypeptides.

Preferably, a variant contains conservative substitutions. A "conservative substitution" is one in which an amino acid is substituted for another amino acid that has similar properties, such that one skilled in the art of peptide chemistry would expect the secondary structure and hydropathic nature of the polypeptide to be substantially unchanged. Amino acid substitutions may generally be made on the basis of similarity in polarity, charge, solubility, hydrophobicity, hydrophilicity and/or the amphipathic nature of the residues. For example, negatively charged amino acids include aspartic acid and glutamic acid; positively charged amino acids include lysine and arginine; and amino acids with uncharged polar head groups having similar hydrophilicity values include leucine, isoleucine and valine; glycine and alanine; asparagine and glutamine; and serine, threonine, phenylalanine and tyrosine. Other groups of amino acids that may represent conservative changes include: (1) ala, pro, gly, glu, asp, gln, asn, ser, thr; (2) cys, ser, tyr, thr; (3) val, ile, leu, met, ala, phe; (4) lys, arg, his; and (5) phe, tyr, trp, his. A variant may also, or alternatively, contain non-conservative changes. In a preferred embodiment, variant polypeptides differ from a native sequence by substitution, deletion or addition of five amino acids or fewer. Variants may also (or alternatively) be modified by, for example, the deletion or addition of amino acids that have minimal influence on the immunogenicity, secondary structure and hydropathic nature of the polypeptide.

As noted above, polypeptides may comprise a signal (or leader) sequence at the N-terminal end of the protein which co-translationally or post-translationally directs transfer of the protein. The polypeptide may also be conjugated to a linker or other sequence for ease of synthesis, purification or identification of the polypeptide (e.g., poly-His), or to enhance binding of the polypeptide to a solid support. For example, a polypeptide may be conjugated to an immunoglobulin Fc region.

Polypeptides may be prepared using any of a variety of well known techniques. Recombinant polypeptides encoded by DNA sequences as described above may be readily prepared from the DNA sequences using any of a variety of expression vectors known to those of ordinary skill in the art. Expression may be achieved in any appropriate host cell that has been transformed or transfected with an expression vector containing a DNA molecule that encodes a recombinant polypeptide. Suitable host cells include prokaryotes, yeast and higher eukaryotic cells. Preferably, the host cells employed are *E. coli*, yeast or a mammalian cell line such as COS or CHO. Supernatants from suitable host/vector systems which secrete recombinant protein or polypeptide into culture media may be first concentrated using a commercially available filter. Following concentration, the concentrate may be applied to a suitable purification matrix such as an affinity matrix or an ion exchange resin. Finally, one or more reverse phase HPLC steps can be employed to further purify a recombinant polypeptide.

Portions and other variants having fewer than about 100 amino acids, and generally fewer than about 50 amino acids, may also be generated by synthetic means, using techniques well known to those of ordinary skill in the art. For example, such polypeptides may be synthesized using any of the commercially available solid-phase techniques, such as the Merrifield solid-phase synthesis method, where amino acids are sequentially added to a growing amino acid chain. See Merrifield, *J. Am. Chem. Soc.* 85:2149-2146, 1963. Equipment for automated synthesis of polypeptides is commercially available from suppliers such as Perkin Elmer/Applied BioSystems Division (Foster City, CA), and may be operated according to the manufacturer's instructions.

Within certain specific embodiments, a polypeptide may be a fusion protein that comprises multiple polypeptides as described herein, or that comprises at least one polypeptide as described herein and an unrelated sequence, such as a known tumor protein. A

fusion partner may, for example, assist in providing T helper epitopes (an immunological fusion partner), preferably T helper epitopes recognized by humans, or may assist in expressing the protein (an expression enhancer) at higher yields than the native recombinant protein. Certain preferred fusion partners are both immunological and expression enhancing
5 fusion partners. Other fusion partners may be selected so as to increase the solubility of the protein or to enable the protein to be targeted to desired intracellular compartments. Still further fusion partners include affinity tags, which facilitate purification of the protein.

Fusion proteins may generally be prepared using standard techniques, including chemical conjugation. Preferably, a fusion protein is expressed as a recombinant
10 protein, allowing the production of increased levels, relative to a non-fused protein, in an expression system. Briefly, DNA sequences encoding the polypeptide components may be assembled separately, and ligated into an appropriate expression vector. The 3' end of the DNA sequence encoding one polypeptide component is ligated, with or without a peptide linker, to the 5' end of a DNA sequence encoding the second polypeptide component so that
15 the reading frames of the sequences are in phase. This permits translation into a single fusion protein that retains the biological activity of both component polypeptides.

A peptide linker sequence may be employed to separate the first and the second polypeptide components by a distance sufficient to ensure that each polypeptide folds into its secondary and tertiary structures. Such a peptide linker sequence is incorporated into
20 the fusion protein using standard techniques well known in the art. Suitable peptide linker sequences may be chosen based on the following factors: (1) their ability to adopt a flexible extended conformation; (2) their inability to adopt a secondary structure that could interact with functional epitopes on the first and second polypeptides; and (3) the lack of hydrophobic or charged residues that might react with the polypeptide functional epitopes. Preferred
25 peptide linker sequences contain Gly, Asn and Ser residues. Other near neutral amino acids, such as Thr and Ala may also be used in the linker sequence. Amino acid sequences which may be usefully employed as linkers include those disclosed in Maratea et al., *Gene* 40:39-46, 1985; Murphy et al., *Proc. Natl. Acad. Sci. USA* 83:8258-8262, 1986; U.S. Patent No. 4,935,233 and U.S. Patent No. 4,751,180. The linker sequence may generally be from 1
30 to about 50 amino acids in length. Linker sequences are not required when the first and

second polypeptides have non-essential N-terminal amino acid regions that can be used to separate the functional domains and prevent steric interference.

The ligated DNA sequences are operably linked to suitable transcriptional or translational regulatory elements. The regulatory elements responsible for expression of DNA are located only 5' to the DNA sequence encoding the first polypeptides. Similarly, stop codons required to end translation and transcription termination signals are only present 3' to the DNA sequence encoding the second polypeptide.

Fusion proteins are also provided that comprise a polypeptide of the present invention together with an unrelated immunogenic protein. Preferably the immunogenic protein is capable of eliciting a recall response. Examples of such proteins include tetanus, tuberculosis and hepatitis proteins (*see, for example, Stoute et al. New Engl. J. Med., 336:86-91, 1997*).

Within preferred embodiments, an immunological fusion partner is derived from protein D, a surface protein of the gram-negative bacterium *Haemophilus influenza B* (WO 91/18926). Preferably, a protein D derivative comprises approximately the first third of the protein (*e.g.*, the first N-terminal 100-110 amino acids), and a protein D derivative may be lipidated. Within certain preferred embodiments, the first 109 residues of a Lipoprotein D fusion partner is included on the N-terminus to provide the polypeptide with additional exogenous T-cell epitopes and to increase the expression level in *E. coli* (thus functioning as an expression enhancer). The lipid tail ensures optimal presentation of the antigen to antigen presenting cells. Other fusion partners include the non-structural protein from influenzae virus, NS1 (hemagglutinin). Typically, the N-terminal 81 amino acids are used, although different fragments that include T-helper epitopes may be used.

In another embodiment, the immunological fusion partner is the protein known as LYTA, or a portion thereof (preferably a C-terminal portion). LYTA is derived from *Streptococcus pneumoniae*, which synthesizes an N-acetyl-L-alanine amidase known as amidase LYTA (encoded by the *LytA* gene; *Gene* 43:265-292, 1986). LYTA is an autolysin that specifically degrades certain bonds in the peptidoglycan backbone. The C-terminal domain of the LYTA protein is responsible for the affinity to the choline or to some choline analogues such as DEAE. This property has been exploited for the development of *E. coli* C-LYTA expressing plasmids useful for expression of fusion proteins. Purification of hybrid

proteins containing the C-LYTA fragment at the amino terminus has been described (*see Biotechnology 10:795-798, 1992*). Within a preferred embodiment, a repeat portion of LYTA may be incorporated into a fusion protein. A repeat portion is found in the C-terminal region starting at residue 178. A particularly preferred repeat portion incorporates residues 188-305.

5 In general, polypeptides (including fusion proteins) and polynucleotides as described herein are isolated. An "isolated" polypeptide or polynucleotide is one that is removed from its original environment. For example, a naturally-occurring protein is isolated if it is separated from some or all of the coexisting materials in the natural system. Preferably, such polypeptides are at least about 90% pure, more preferably at least about 95%
10 pure and most preferably at least about 99% pure. A polynucleotide is considered to be isolated if, for example, it is cloned into a vector that is not a part of the natural environment.

BINDING AGENTS

The present invention further provides agents, such as antibodies and antigen-
15 binding fragments thereof, that specifically bind to a colon tumor protein. As used herein, an antibody, or antigen-binding fragment thereof, is said to "specifically bind" to a colon tumor protein if it reacts at a detectable level (within, for example, an ELISA) with a colon tumor protein, and does not react detectably with unrelated proteins under similar conditions. As used herein, "binding" refers to a noncovalent association between two separate molecules
20 such that a complex is formed. The ability to bind may be evaluated by, for example, determining a binding constant for the formation of the complex. The binding constant is the value obtained when the concentration of the complex is divided by the product of the component concentrations. In general, two compounds are said to "bind," in the context of the present invention, when the binding constant for complex formation exceeds about 10^3
25 L/mol. The binding constant may be determined using methods well known in the art.

Binding agents may be further capable of differentiating between patients with and without a cancer, such as colon cancer, using the representative assays provided herein. In other words, antibodies or other binding agents that bind to a colon tumor protein will generate a signal indicating the presence of a cancer in at least about 20% of patients with the
30 disease, and will generate a negative signal indicating the absence of the disease in at least about 90% of individuals without the cancer. To determine whether a binding agent satisfies

this requirement, biological samples (e.g., blood, sera, sputum, urine and/or tumor biopsies) from patients with and without a cancer (as determined using standard clinical tests) may be assayed as described herein for the presence of polypeptides that bind to the binding agent. It will be apparent that a statistically significant number of samples with and without the disease should be assayed. Each binding agent should satisfy the above criteria; however, those of ordinary skill in the art will recognize that binding agents may be used in combination to improve sensitivity.

Any agent that satisfies the above requirements may be a binding agent. For example, a binding agent may be a ribosome, with or without a peptide component, an RNA molecule or a polypeptide. In a preferred embodiment, a binding agent is an antibody or an antigen-binding fragment thereof. Antibodies may be prepared by any of a variety of techniques known to those of ordinary skill in the art. *See, e.g., Harlow and Lane, Antibodies: A Laboratory Manual*, Cold Spring Harbor Laboratory, 1988. In general, antibodies can be produced by cell culture techniques, including the generation of monoclonal antibodies as described herein, or via transfection of antibody genes into suitable bacterial or mammalian cell hosts, in order to allow for the production of recombinant antibodies. In one technique, an immunogen comprising the polypeptide is initially injected into any of a wide variety of mammals (e.g., mice, rats, rabbits, sheep or goats). In this step, the polypeptides of this invention may serve as the immunogen without modification. Alternatively, particularly for relatively short polypeptides, a superior immune response may be elicited if the polypeptide is joined to a carrier protein, such as bovine serum albumin or keyhole limpet hemocyanin. The immunogen is injected into the animal host, preferably according to a predetermined schedule incorporating one or more booster immunizations, and the animals are bled periodically. Polyclonal antibodies specific for the polypeptide may then be purified from such antisera by, for example, affinity chromatography using the polypeptide coupled to a suitable solid support.

Monoclonal antibodies specific for an antigenic polypeptide of interest may be prepared, for example, using the technique of Kohler and Milstein, *Eur. J. Immunol.* 6:511-519, 1976, and improvements thereto. Briefly, these methods involve the preparation of immortal cell lines capable of producing antibodies having the desired specificity (i.e., reactivity with the polypeptide of interest). Such cell lines may be produced, for example,

from spleen cells obtained from an animal immunized as described above. The spleen cells are then immortalized by, for example, fusion with a myeloma cell fusion partner, preferably one that is syngeneic with the immunized animal. A variety of fusion techniques may be employed. For example, the spleen cells and myeloma cells may be combined with a nonionic detergent for a few minutes and then plated at low density on a selective medium that supports the growth of hybrid cells, but not myeloma cells. A preferred selection technique uses HAT (hypoxanthine, aminopterin, thymidine) selection. After a sufficient time, usually about 1 to 2 weeks, colonies of hybrids are observed. Single colonies are selected and their culture supernatants tested for binding activity against the polypeptide.

10 Hybridomas having high reactivity and specificity are preferred.

Monoclonal antibodies may be isolated from the supernatants of growing hybridoma colonies. In addition, various techniques may be employed to enhance the yield, such as injection of the hybridoma cell line into the peritoneal cavity of a suitable vertebrate host, such as a mouse. Monoclonal antibodies may then be harvested from the ascites fluid or the blood. Contaminants may be removed from the antibodies by conventional techniques, such as chromatography, gel filtration, precipitation, and extraction. The polypeptides of this invention may be used in the purification process in, for example, an affinity chromatography step.

15

Within certain embodiments, the use of antigen-binding fragments of antibodies may be preferred. Such fragments include Fab fragments, which may be prepared using standard techniques. Briefly, immunoglobulins may be purified from rabbit serum by affinity chromatography on Protein A bead columns (Harlow and Lane, *Antibodies: A Laboratory Manual*, Cold Spring Harbor Laboratory, 1988) and digested by papain to yield Fab and Fc fragments. The Fab and Fc fragments may be separated by affinity chromatography on protein A bead columns.

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25

Monoclonal antibodies of the present invention may be coupled to one or more therapeutic agents. Suitable agents in this regard include radionuclides, differentiation inducers, drugs, toxins, and derivatives thereof. Preferred radionuclides include ^{90}Y , ^{123}I , ^{125}I , ^{131}I , ^{186}Re , ^{188}Re , ^{211}At , and ^{212}Bi . Preferred drugs include methotrexate, and pyrimidine and purine analogs. Preferred differentiation inducers include phorbol esters and butyric acid.

30

Preferred toxins include ricin, abrin, diphtheria toxin, cholera toxin, gelonin, *Pseudomonas* exotoxin, *Shigella* toxin, and pokeweed antiviral protein.

A therapeutic agent may be coupled (*e.g.*, covalently bonded) to a suitable monoclonal antibody either directly or indirectly (*e.g.*, via a linker group). A direct reaction
5 between an agent and an antibody is possible when each possesses a substituent capable of reacting with the other. For example, a nucleophilic group, such as an amino or sulfhydryl group, on one may be capable of reacting with a carbonyl-containing group, such as an anhydride or an acid halide, or with an alkyl group containing a good leaving group (*e.g.*, a halide) on the other.

10 Alternatively, it may be desirable to couple a therapeutic agent and an antibody via a linker group. A linker group can function as a spacer to distance an antibody from an agent in order to avoid interference with binding capabilities. A linker group can also serve to increase the chemical reactivity of a substituent on an agent or an antibody, and thus increase the coupling efficiency. An increase in chemical reactivity may also facilitate
15 the use of agents, or functional groups on agents, which otherwise would not be possible.

It will be evident to those skilled in the art that a variety of bifunctional or polyfunctional reagents, both homo- and hetero-functional (such as those described in the catalog of the Pierce Chemical Co., Rockford, IL), may be employed as the linker group. Coupling may be effected, for example, through amino groups, carboxyl groups, sulfhydryl
20 groups or oxidized carbohydrate residues. There are numerous references describing such methodology, *e.g.*, U.S. Patent No. 4,671,958, to Rodwell et al.

Where a therapeutic agent is more potent when free from the antibody portion of the immunoconjugates of the present invention, it may be desirable to use a linker group which is cleavable during or upon internalization into a cell. A number of different cleavable
25 linker groups have been described. The mechanisms for the intracellular release of an agent from these linker groups include cleavage by reduction of a disulfide bond (*e.g.*, U.S. Patent No. 4,489,710, to Spitler), by irradiation of a photolabile bond (*e.g.*, U.S. Patent No. 4,625,014, to Senter et al.), by hydrolysis of derivatized amino acid side chains (*e.g.*, U.S. Patent No. 4,638,045, to Kohn et al.), by serum complement-mediated hydrolysis (*e.g.*, U.S.
30 Patent No. 4,671,958, to Rodwell et al.), and acid-catalyzed hydrolysis (*e.g.*, U.S. Patent No. 4,569,789, to Blattler et al.).

It may be desirable to couple more than one agent to an antibody. In one embodiment, multiple molecules of an agent are coupled to one antibody molecule. In another embodiment, more than one type of agent may be coupled to one antibody. Regardless of the particular embodiment, immunoconjugates with more than one agent may
5 be prepared in a variety of ways. For example, more than one agent may be coupled directly to an antibody molecule, or linkers which provide multiple sites for attachment can be used. Alternatively, a carrier can be used.

A carrier may bear the agents in a variety of ways, including covalent bonding either directly or via a linker group. Suitable carriers include proteins such as albumins (*e.g.*,
10 U.S. Patent No. 4,507,234, to Kato et al.), peptides and polysaccharides such as aminodextran (*e.g.*, U.S. Patent No. 4,699,784, to Shih et al.). A carrier may also bear an agent by noncovalent bonding or by encapsulation, such as within a liposome vesicle (*e.g.*, U.S. Patent Nos. 4,429,008 and 4,873,088). Carriers specific for radionuclide agents include
15 radiohalogenated small molecules and chelating compounds. For example, U.S. Patent No. 4,735,792 discloses representative radiohalogenated small molecules and their synthesis. A radionuclide chelate may be formed from chelating compounds that include those containing nitrogen and sulfur atoms as the donor atoms for binding the metal, or metal oxide, radionuclide. For example, U.S. Patent No. 4,673,562, to Davison et al. discloses representative chelating compounds and their synthesis.

20 A variety of routes of administration for the antibodies and immunoconjugates may be used. Typically, administration will be intravenous, intramuscular, subcutaneous or in the bed of a resected tumor. It will be evident that the precise dose of the antibody/immunoconjugate will vary depending upon the antibody used, the antigen density on the tumor, and the rate of clearance of the antibody.

25

T CELLS

Immunotherapeutic compositions may also, or alternatively, comprise T cells specific for a colon tumor protein. Such cells may generally be prepared *in vitro* or *ex vivo*, using standard procedures. For example, T cells may be isolated from bone marrow,
30 peripheral blood, or a fraction of bone marrow or peripheral blood of a patient, using a commercially available cell separation system, such as the ISOLEX™ system, available from

Nexell Therapeutics Inc., Irvine, CA . Alternatively, T cells may be derived from related or unrelated humans, non-human mammals, cell lines or cultures.

5 T cells may be stimulated with a colon tumor polypeptide, polynucleotide encoding a colon tumor polypeptide and/or an antigen presenting cell (APC) that expresses such a polypeptide. Such stimulation is performed under conditions and for a time sufficient to permit the generation of T cells that are specific for the polypeptide. Preferably, a colon tumor polypeptide or polynucleotide is present within a delivery vehicle, such as a microsphere, to facilitate the generation of specific T cells.

10 T cells are considered to be specific for a colon tumor polypeptide if the T cells kill target cells coated with the polypeptide or expressing a gene encoding the polypeptide. T cell specificity may be evaluated using any of a variety of standard techniques. For example, within a chromium release assay or proliferation assay, a stimulation index of more than two fold increase in lysis and/or proliferation, compared to negative controls, indicates T cell specificity. Such assays may be performed, for example, as
15 described in Chen et al., *Cancer Res.* 54:1065-1070, 1994. Alternatively, detection of the proliferation of T cells may be accomplished by a variety of known techniques. For example, T cell proliferation can be detected by measuring an increased rate of DNA synthesis (e.g., by pulse-labeling cultures of T cells with tritiated thymidine and measuring the amount of tritiated thymidine incorporated into DNA). Contact with a colon tumor polypeptide (100
20 ng/ml - 100 µg/ml, preferably 200 ng/ml - 25 µg/ml) for 3 - 7 days should result in at least a two fold increase in proliferation of the T cells. Contact as described above for 2-3 hours should result in activation of the T cells, as measured using standard cytokine assays in which a two fold increase in the level of cytokine release (e.g., TNF or IFN-γ) is indicative of T cell activation (see Coligan et al., *Current Protocols in Immunology*, vol. 1, Wiley Interscience
25 (Greene 1998)). T cells that have been activated in response to a colon tumor polypeptide, polynucleotide or polypeptide-expressing APC may be CD4⁺ and/or CD8⁺. Colon tumor protein-specific T cells may be expanded using standard techniques. Within preferred embodiments, the T cells are derived from either a patient or a related, or unrelated, donor and are administered to the patient following stimulation and expansion.

30 For therapeutic purposes, CD4⁺ or CD8⁺ T cells that proliferate in response to a colon tumor polypeptide, polynucleotide or APC can be expanded in number either *in vitro*

or *in vivo*. Proliferation of such T cells *in vitro* may be accomplished in a variety of ways. For example, the T cells can be re-exposed to a colon tumor polypeptide, or a short peptide corresponding to an immunogenic portion of such a polypeptide, with or without the addition of T cell growth factors, such as interleukin-2, and/or stimulator cells that synthesize a colon tumor polypeptide. Alternatively, one or more T cells that proliferate in the presence of a colon tumor protein can be expanded in number by cloning. Methods for cloning cells are well known in the art, and include limiting dilution.

PHARMACEUTICAL COMPOSITIONS AND VACCINES

Within certain aspects, polypeptides, polynucleotides, T cells and/or binding agents disclosed herein may be incorporated into pharmaceutical compositions or immunogenic compositions (*i.e.*, vaccines). Pharmaceutical compositions comprise one or more such compounds and a physiologically acceptable carrier. Vaccines may comprise one or more such compounds and an immunostimulant. An immunostimulant may be any substance that enhances or potentiates an immune response to an exogenous antigen. Examples of immunostimulants include adjuvants, biodegradable microspheres (*e.g.*, polylactic galactide) and liposomes (into which the compound is incorporated; *see e.g.*, Fullerton, U.S. Patent No. 4,235,877). Vaccine preparation is generally described in, for example, M.F. Powell and M.J. Newman, eds., "Vaccine Design (the subunit and adjuvant approach)," Plenum Press (NY, 1995). Pharmaceutical compositions and vaccines within the scope of the present invention may also contain other compounds, which may be biologically active or inactive. For example, one or more immunogenic portions of other tumor antigens may be present, either incorporated into a fusion polypeptide or as a separate compound, within the composition or vaccine.

A pharmaceutical composition or vaccine may contain DNA encoding one or more of the polypeptides as described above, such that the polypeptide is generated *in situ*. As noted above, the DNA may be present within any of a variety of delivery systems known to those of ordinary skill in the art, including nucleic acid expression systems, bacteria and viral expression systems. Numerous gene delivery techniques are well known in the art, such as those described by Rolland, *Crit. Rev. Therap. Drug Carrier Systems* 15:143-198, 1998, and references cited therein. Appropriate nucleic acid expression systems contain the

necessary DNA sequences for expression in the patient (such as a suitable promoter and terminating signal). Bacterial delivery systems involve the administration of a bacterium (such as *Bacillus-Calmette-Guerrin*) that expresses an immunogenic portion of the polypeptide on its cell surface or secretes such an epitope. In a preferred embodiment, the

5 DNA may be introduced using a viral expression system (e.g., vaccinia or other pox virus, retrovirus, or adenovirus), which may involve the use of a non-pathogenic (defective), replication competent virus. Suitable systems are disclosed, for example, in Fisher-Hoch et al., *Proc. Natl. Acad. Sci. USA* 86:317-321, 1989; Flexner et al., *Ann. N.Y. Acad. Sci.* 569:86-103, 1989; Flexner et al., *Vaccine* 8:17-21, 1990; U.S. Patent Nos. 4,603,112,

10 4,769,330, and 5,017,487; WO 89/01973; U.S. Patent No. 4,777,127; GB 2,200,651; EP 0,345,242; WO 91/02805; Berkner, *Biotechniques* 6:616-627, 1988; Rosenfeld et al., *Science* 252:431-434, 1991; Kolls et al., *Proc. Natl. Acad. Sci. USA* 91:215-219, 1994; Kass-Eisler et al., *Proc. Natl. Acad. Sci. USA* 90:11498-11502, 1993; Guzman et al., *Circulation* 88:2838-2848, 1993; and Guzman et al., *Cir. Res.* 73:1202-1207, 1993.

15 Techniques for incorporating DNA into such expression systems are well known to those of ordinary skill in the art. The DNA may also be "naked," as described, for example, in Ulmer et al., *Science* 259:1745-1749, 1993 and reviewed by Cohen, *Science* 259:1691-1692, 1993. The uptake of naked DNA may be increased by coating the DNA onto biodegradable beads, which are efficiently transported into the cells.

20 While any suitable carrier known to those of ordinary skill in the art may be employed in the pharmaceutical compositions of this invention, the type of carrier will vary depending on the mode of administration. Compositions of the present invention may be formulated for any appropriate manner of administration, including for example, topical, oral, nasal, intravenous, intracranial, intraperitoneal, subcutaneous or intramuscular administration.

25 For parenteral administration, such as subcutaneous injection, the carrier preferably comprises water, saline, alcohol, a fat, a wax or a buffer. For oral administration, any of the above carriers or a solid carrier, such as mannitol, lactose, starch, magnesium stearate, sodium saccharine, talcum, cellulose, glucose, sucrose, and magnesium carbonate, may be employed. Biodegradable microspheres (e.g., polylactate polyglycolate) may also be

30 employed as carriers for the pharmaceutical compositions of this invention. Suitable biodegradable microspheres are disclosed, for example, in U.S. Patent Nos. 4,897,268 and

5,075,109.

Such compositions may also comprise buffers (*e.g.*, neutral buffered saline or phosphate buffered saline), carbohydrates (*e.g.*, glucose, mannose, sucrose or dextrans), mannitol, proteins, polypeptides or amino acids such as glycine, antioxidants, chelating agents such as EDTA or glutathione, adjuvants (*e.g.*, aluminum hydroxide) and/or preservatives. Alternatively, compositions of the present invention may be formulated as a lyophilizate. Compounds may also be encapsulated within liposomes using well known technology.

Any of a variety of immunostimulants may be employed in the vaccines of this invention. For example, an adjuvant may be included. Most adjuvants contain a substance designed to protect the antigen from rapid catabolism, such as aluminum hydroxide or mineral oil, and a stimulator of immune responses, such as lipid A, *Bordetella pertussis* or *Mycobacterium tuberculosis* derived proteins. Suitable adjuvants are commercially available as, for example, Freund's Incomplete Adjuvant and Complete Adjuvant (Difco Laboratories, Detroit, MI); Merck Adjuvant 65 (Merck and Company, Inc., Rahway, NJ); aluminum salts such as aluminum hydroxide gel (alum) or aluminum phosphate; salts of calcium, iron or zinc; an insoluble suspension of acylated tyrosine; acylated sugars; cationically or anionically derivatized polysaccharides; polyphosphazenes; biodegradable microspheres; monophosphoryl lipid A and quil A. Cytokines, such as GM-CSF or interleukin-2, -7, or -12, may also be used as adjuvants.

Within the vaccines provided herein, the adjuvant composition is preferably designed to induce an immune response predominantly of the Th1 type. High levels of Th1-type cytokines (*e.g.*, IFN- γ , TNF α , IL-2 and IL-12) tend to favor the induction of cell mediated immune responses to an administered antigen. In contrast, high levels of Th2-type cytokines (*e.g.*, IL-4, IL-5, IL-6 and IL-10) tend to favor the induction of humoral immune responses. Following application of a vaccine as provided herein, a patient will support an immune response that includes Th1- and Th2-type responses. Within a preferred embodiment, in which a response is predominantly Th1-type, the level of Th1-type cytokines will increase to a greater extent than the level of Th2-type cytokines. The levels of these cytokines may be readily assessed using standard assays. For a review of the families of cytokines, see Mosmann and Coffman, *Ann. Rev. Immunol.* 7:145-173, 1989.

Preferred adjuvants for use in eliciting a predominantly Th1-type response include, for example, a combination of monophosphoryl lipid A, preferably 3-de-O-acylated monophosphoryl lipid A (3D-MPL), together with an aluminum salt. MPL adjuvants are available from Ribi ImmunoChem Research Inc. (Hamilton, MT) (*see* US Patent Nos. 5 4,436,727; 4,877,611; 4,866,034 and 4,912,094). CpG-containing oligonucleotides (in which the CpG dinucleotide is unmethylated) also induce a predominantly Th1 response. Such oligonucleotides are well known and are described, for example, in WO 96/02555. Another preferred adjuvant is a saponin, preferably QS21, which may be used alone or in combination with other adjuvants. For example, an enhanced system involves the combination of a 10 monophosphoryl lipid A and saponin derivative, such as the combination of QS21 and 3D-MPL as described in WO 94/00153, or a less reactogenic composition where the QS21 is quenched with cholesterol, as described in WO 96/33739. Other preferred formulations comprises an oil-in-water emulsion and tocopherol. A particularly potent adjuvant formulation involving QS21, 3D-MPL and tocopherol in an oil-in-water emulsion is 15 described in WO 95/17210. Any vaccine provided herein may be prepared using well known methods that result in a combination of antigen, immune response enhancer and a suitable carrier or excipient.

The compositions described herein may be administered as part of a sustained release formulation (*i.e.*, a formulation such as a capsule, sponge or gel (composed of 20 polysaccharides, for example) that effects a slow release of compound following administration). Such formulations may generally be prepared using well known technology and administered by, for example, oral, rectal or subcutaneous implantation, or by implantation at the desired target site. Sustained-release formulations may contain a polypeptide, polynucleotide or antibody dispersed in a carrier matrix and/or contained within 25 a reservoir surrounded by a rate controlling membrane. Carriers for use within such formulations are biocompatible, and may also be biodegradable; preferably the formulation provides a relatively constant level of active component release. The amount of active compound contained within a sustained release formulation depends upon the site of implantation, the rate and expected duration of release and the nature of the condition to be 30 treated or prevented.

Any of a variety of delivery vehicles may be employed within pharmaceutical

compositions and vaccines to facilitate production of an antigen-specific immune response that targets tumor cells. Delivery vehicles include antigen presenting cells (APCs), such as dendritic cells, macrophages, B cells, monocytes and other cells that may be engineered to be efficient APCs. Such cells may, but need not, be genetically modified to increase the capacity for presenting the antigen, to improve activation and/or maintenance of the T cell response, to have anti-tumor effects *per se* and/or to be immunologically compatible with the receiver (*i.e.*, matched HLA haplotype). APCs may generally be isolated from any of a variety of biological fluids and organs, including tumor and peritumoral tissues, and may be autologous, allogeneic, syngeneic or xenogeneic cells.

10 Certain preferred embodiments of the present invention use dendritic cells or progenitors thereof as antigen-presenting cells. Dendritic cells are highly potent APCs (Banchereau and Steinman, *Nature* 392:245-251, 1998) and have been shown to be effective as a physiological adjuvant for eliciting prophylactic or therapeutic antitumor immunity (*see* Timmerman and Levy, *Ann. Rev. Med.* 50:507-529, 1999). In general, dendritic cells may be identified based on their typical shape (stellate *in situ*, with marked cytoplasmic processes (dendrites) visible *in vitro*), their ability to take up, process and present antigens with high efficiency, and their ability to activate naïve T cell responses. Dendritic cells may, of course, be engineered to express specific cell-surface receptors or ligands that are not commonly found on dendritic cells *in vivo* or *ex vivo*, and such modified dendritic cells are contemplated by the present invention. As an alternative to dendritic cells, secreted vesicles antigen-loaded dendritic cells (called exosomes) may be used within a vaccine (*see* Zitvogel et al., *Nature Med.* 4:594-600, 1998).

25 Dendritic cells and progenitors may be obtained from peripheral blood, bone marrow, tumor-infiltrating cells, peritumoral tissues-infiltrating cells, lymph nodes, spleen, skin, umbilical cord blood or any other suitable tissue or fluid. For example, dendritic cells may be differentiated *ex vivo* by adding a combination of cytokines such as GM-CSF, IL-4, IL-13 and/or TNF α to cultures of monocytes harvested from peripheral blood. Alternatively, CD34 positive cells harvested from peripheral blood, umbilical cord blood or bone marrow may be differentiated into dendritic cells by adding to the culture medium combinations of GM-CSF, IL-3, TNF α , CD40 ligand, LPS, flt3 ligand and/or other compound(s) that induce differentiation, maturation and proliferation of dendritic cells.

Dendritic cells are conveniently categorized as "immature" and "mature" cells, which allows a simple way to discriminate between two well characterized phenotypes. However, this nomenclature should not be construed to exclude all possible intermediate stages of differentiation. Immature dendritic cells are characterized as APC with a high capacity for antigen uptake and processing, which correlates with the high expression of Fcγ receptor and mannose receptor. The mature phenotype is typically characterized by a lower expression of these markers, but a high expression of cell surface molecules responsible for T cell activation such as class I and class II MHC, adhesion molecules (*e.g.*, CD54 and CD11) and costimulatory molecules (*e.g.*, CD40, CD80, CD86 and 4-1BB).

APCs may generally be transfected with a polynucleotide encoding a colon tumor protein (or portion or other variant thereof) such that the colon tumor polypeptide, or an immunogenic portion thereof, is expressed on the cell surface. Such transfection may take place *ex vivo*, and a composition or vaccine comprising such transfected cells may then be used for therapeutic purposes, as described herein. Alternatively, a gene delivery vehicle that targets a dendritic or other antigen presenting cell may be administered to a patient, resulting in transfection that occurs *in vivo*. *In vivo* and *ex vivo* transfection of dendritic cells, for example, may generally be performed using any methods known in the art, such as those described in WO 97/24447, or the gene gun approach described by Mahvi et al., *Immunology and cell Biology* 75:456-460, 1997. Antigen loading of dendritic cells may be achieved by incubating dendritic cells or progenitor cells with the colon tumor polypeptide, DNA (naked or within a plasmid vector) or RNA; or with antigen-expressing recombinant bacterium or viruses (*e.g.*, vaccinia, fowlpox, adenovirus or lentivirus vectors). Prior to loading, the polypeptide may be covalently conjugated to an immunological partner that provides T cell help (*e.g.*, a carrier molecule). Alternatively, a dendritic cell may be pulsed with a non-conjugated immunological partner, separately or in the presence of the polypeptide.

CANCER THERAPY

In further aspects of the present invention, the compositions described herein may be used for immunotherapy of cancer, such as colon cancer. Within such methods, pharmaceutical compositions and vaccines are typically administered to a patient. As used herein, a "patient" refers to any warm-blooded animal, preferably a human. A patient may or

may not be afflicted with cancer. Accordingly, the above pharmaceutical compositions and vaccines may be used to prevent the development of a cancer or to treat a patient afflicted with a cancer. A cancer may be diagnosed using criteria generally accepted in the art, including the presence of a malignant tumor. Pharmaceutical compositions and vaccines may be administered either prior to or following surgical removal of primary tumors and/or treatment such as administration of radiotherapy or conventional chemotherapeutic drugs.

Within certain embodiments, immunotherapy may be active immunotherapy, in which treatment relies on the *in vivo* stimulation of the endogenous host immune system to react against tumors with the administration of immune response-modifying agents (such as polypeptides and polynucleotides disclosed herein).

Within other embodiments, immunotherapy may be passive immunotherapy, in which treatment involves the delivery of agents with established tumor-immune reactivity (such as effector cells or antibodies) that can directly or indirectly mediate antitumor effects and does not necessarily depend on an intact host immune system. Examples of effector cells include T cells as discussed above, T lymphocytes (such as CD8⁺ cytotoxic T lymphocytes and CD4⁺ T-helper tumor-infiltrating lymphocytes), killer cells (such as Natural Killer cells and lymphokine-activated killer cells), B cells and antigen-presenting cells (such as dendritic cells and macrophages) expressing a polypeptide provided herein. T cell receptors and antibody receptors specific for the polypeptides recited herein may be cloned, expressed and transferred into other vectors or effector cells for adoptive immunotherapy. The polypeptides provided herein may also be used to generate antibodies or anti-idiotypic antibodies (as described above and in U.S. Patent No. 4,918,164) for passive immunotherapy.

Effector cells may generally be obtained in sufficient quantities for adoptive immunotherapy by growth *in vitro*, as described herein. Culture conditions for expanding single antigen-specific effector cells to several billion in number with retention of antigen recognition *in vivo* are well known in the art. Such *in vitro* culture conditions typically use intermittent stimulation with antigen, often in the presence of cytokines (such as IL-2) and non-dividing feeder cells. As noted above, immunoreactive polypeptides as provided herein may be used to rapidly expand antigen-specific T cell cultures in order to generate a sufficient number of cells for immunotherapy. In particular, antigen-presenting cells, such as dendritic, macrophage, monocyte, fibroblast and/or B cells, may be pulsed with immunoreactive

polypeptides or transfected with one or more polynucleotides using standard techniques well known in the art. For example, antigen-presenting cells can be transfected with a polynucleotide having a promoter appropriate for increasing expression in a recombinant virus or other expression system. Cultured effector cells for use in therapy must be able to grow and distribute widely, and to survive long term *in vivo*. Studies have shown that cultured effector cells can be induced to grow *in vivo* and to survive long term in substantial numbers by repeated stimulation with antigen supplemented with IL-2 (*see*, for example, Cheever et al., *Immunological Reviews* 157:177, 1997).

Alternatively, a vector expressing a polypeptide recited herein may be introduced into antigen presenting cells taken from a patient and clonally propagated *ex vivo* for transplant back into the same patient. Transfected cells may be reintroduced into the patient using any means known in the art, preferably in sterile form by intravenous, intracavitary, intraperitoneal or intratumor administration.

Routes and frequency of administration of the therapeutic compositions disclosed herein, as well as dosage, will vary from individual to individual, and may be readily established using standard techniques. In general, the pharmaceutical compositions and vaccines may be administered by injection (*e.g.*, intracutaneous, intramuscular, intravenous or subcutaneous), intranasally (*e.g.*, by aspiration) or orally. Preferably, between 1 and 10 doses may be administered over a 52 week period. Preferably, 6 doses are administered, at intervals of 1 month, and booster vaccinations may be given periodically thereafter. Alternate protocols may be appropriate for individual patients. A suitable dose is an amount of a compound that, when administered as described above, is capable of promoting an anti-tumor immune response, and is at least 10-50% above the basal (*i.e.*, untreated) level. Such response can be monitored by measuring the anti-tumor antibodies in a patient or by vaccine-dependent generation of cytolytic effector cells capable of killing the patient's tumor cells *in vitro*. Such vaccines should also be capable of causing an immune response that leads to an improved clinical outcome (*e.g.*, more frequent remissions, complete or partial or longer disease-free survival) in vaccinated patients as compared to non-vaccinated patients. In general, for pharmaceutical compositions and vaccines comprising one or more polypeptides, the amount of each polypeptide present in a dose ranges from about 25 μ g to 5 mg per kg of host. Suitable dose sizes will vary with the size of the patient,

but will typically range from about 0.1 mL to about 5 mL.

In general, an appropriate dosage and treatment regimen provides the active compound(s) in an amount sufficient to provide therapeutic and/or prophylactic benefit. Such a response can be monitored by establishing an improved clinical outcome (*e.g.*, more frequent remissions, complete or partial, or longer disease-free survival) in treated patients as compared to non-treated patients. Increases in preexisting immune responses to a colon tumor protein generally correlate with an improved clinical outcome. Such immune responses may generally be evaluated using standard proliferation, cytotoxicity or cytokine assays, which may be performed using samples obtained from a patient before and after treatment.

METHODS FOR DETECTING CANCER

In general, a cancer may be detected in a patient based on the presence of one or more colon tumor proteins and/or polynucleotides encoding such proteins in a biological sample (for example, blood, sera, sputum, urine and/or tumor biopsies) obtained from the patient. In other words, such proteins may be used as markers to indicate the presence or absence of a cancer such as colon cancer. In addition, such proteins may be useful for the detection of other cancers. The binding agents provided herein generally permit detection of the level of antigen that binds to the agent in the biological sample. Polynucleotide primers and probes may be used to detect the level of mRNA encoding a tumor protein, which is also indicative of the presence or absence of a cancer. In general, a colon tumor sequence should be present at a level that is at least three fold higher in tumor tissue than in normal tissue

There are a variety of assay formats known to those of ordinary skill in the art for using a binding agent to detect polypeptide markers in a sample. *See, e.g.*, Harlow and Lane, *Antibodies: A Laboratory Manual*, Cold Spring Harbor Laboratory, 1988. In general, the presence or absence of a cancer in a patient may be determined by (a) contacting a biological sample obtained from a patient with a binding agent; (b) detecting in the sample a level of polypeptide that binds to the binding agent; and (c) comparing the level of polypeptide with a predetermined cut-off value.

In a preferred embodiment, the assay involves the use of binding agent immobilized on a solid support to bind to and remove the polypeptide from the remainder of

the sample. The bound polypeptide may then be detected using a detection reagent that contains a reporter group and specifically binds to the binding agent/polypeptide complex. Such detection reagents may comprise, for example, a binding agent that specifically binds to the polypeptide or an antibody or other agent that specifically binds to the binding agent, such as an anti-immunoglobulin, protein G, protein A or a lectin. Alternatively, a competitive assay may be utilized, in which a polypeptide is labeled with a reporter group and allowed to bind to the immobilized binding agent after incubation of the binding agent with the sample. The extent to which components of the sample inhibit the binding of the labeled polypeptide to the binding agent is indicative of the reactivity of the sample with the immobilized binding agent. Suitable polypeptides for use within such assays include full length colon tumor proteins and portions thereof to which the binding agent binds, as described above.

The solid support may be any material known to those of ordinary skill in the art to which the tumor protein may be attached. For example, the solid support may be a test well in a microtiter plate or a nitrocellulose or other suitable membrane. Alternatively, the support may be a bead or disc, such as glass, fiberglass, latex or a plastic material such as polystyrene or polyvinylchloride. The support may also be a magnetic particle or a fiber optic sensor, such as those disclosed, for example, in U.S. Patent No. 5,359,681. The binding agent may be immobilized on the solid support using a variety of techniques known to those of skill in the art, which are amply described in the patent and scientific literature. In the context of the present invention, the term "immobilization" refers to both noncovalent association, such as adsorption, and covalent attachment (which may be a direct linkage between the agent and functional groups on the support or may be a linkage by way of a cross-linking agent). Immobilization by adsorption to a well in a microtiter plate or to a membrane is preferred. In such cases, adsorption may be achieved by contacting the binding agent, in a suitable buffer, with the solid support for a suitable amount of time. The contact time varies with temperature, but is typically between about 1 hour and about 1 day. In general, contacting a well of a plastic microtiter plate (such as polystyrene or polyvinylchloride) with an amount of binding agent ranging from about 10 ng to about 10 µg, and preferably about 100 ng to about 1 µg, is sufficient to immobilize an adequate amount of binding agent.

Covalent attachment of binding agent to a solid support may generally be achieved by first reacting the support with a bifunctional reagent that will react with both the support and a functional group, such as a hydroxyl or amino group, on the binding agent. For example, the binding agent may be covalently attached to supports having an appropriate polymer coating using benzoquinone or by condensation of an aldehyde group on the support with an amine and an active hydrogen on the binding partner (*see, e.g.,* Pierce Immunotechnology Catalog and Handbook, 1991, at A12-A13).

In certain embodiments, the assay is a two-antibody sandwich assay. This assay may be performed by first contacting an antibody that has been immobilized on a solid support, commonly the well of a microtiter plate, with the sample, such that polypeptides within the sample are allowed to bind to the immobilized antibody. Unbound sample is then removed from the immobilized polypeptide-antibody complexes and a detection reagent (preferably a second antibody capable of binding to a different site on the polypeptide) containing a reporter group is added. The amount of detection reagent that remains bound to the solid support is then determined using a method appropriate for the specific reporter group.

More specifically, once the antibody is immobilized on the support as described above, the remaining protein binding sites on the support are typically blocked. Any suitable blocking agent known to those of ordinary skill in the art, such as bovine serum albumin or Tween 20™ (Sigma Chemical Co., St. Louis, MO). The immobilized antibody is then incubated with the sample, and polypeptide is allowed to bind to the antibody. The sample may be diluted with a suitable diluent, such as phosphate-buffered saline (PBS) prior to incubation. In general, an appropriate contact time (*i.e.,* incubation time) is a period of time that is sufficient to detect the presence of polypeptide within a sample obtained from an individual with colon cancer. Preferably, the contact time is sufficient to achieve a level of binding that is at least about 95% of that achieved at equilibrium between bound and unbound polypeptide. Those of ordinary skill in the art will recognize that the time necessary to achieve equilibrium may be readily determined by assaying the level of binding that occurs over a period of time. At room temperature, an incubation time of about 30 minutes is generally sufficient.

Unbound sample may then be removed by washing the solid support with an appropriate buffer, such as PBS containing 0.1% Tween 20™. The second antibody, which contains a reporter group, may then be added to the solid support. Preferred reporter groups include those groups recited above.

5 The detection reagent is then incubated with the immobilized antibody-polypeptide complex for an amount of time sufficient to detect the bound polypeptide. An appropriate amount of time may generally be determined by assaying the level of binding that occurs over a period of time. Unbound detection reagent is then removed and bound detection reagent is detected using the reporter group. The method employed for detecting
10 the reporter group depends upon the nature of the reporter group. For radioactive groups, scintillation counting or autoradiographic methods are generally appropriate. Spectroscopic methods may be used to detect dyes, luminescent groups and fluorescent groups. Biotin may be detected using avidin, coupled to a different reporter group (commonly a radioactive or fluorescent group or an enzyme). Enzyme reporter groups may generally be detected by the
15 addition of substrate (generally for a specific period of time), followed by spectroscopic or other analysis of the reaction products.

To determine the presence or absence of a cancer, such as colon cancer, the signal detected from the reporter group that remains bound to the solid support is generally compared to a signal that corresponds to a predetermined cut-off value. In one preferred
20 embodiment, the cut-off value for the detection of a cancer is the average mean signal obtained when the immobilized antibody is incubated with samples from patients without the cancer. In general, a sample generating a signal that is three standard deviations above the predetermined cut-off value is considered positive for the cancer. In an alternate preferred embodiment, the cut-off value is determined using a Receiver Operator Curve, according to
25 the method of Sackett et al., *Clinical Epidemiology: A Basic Science for Clinical Medicine*, Little Brown and Co., 1985, p. 106-7. Briefly, in this embodiment, the cut-off value may be determined from a plot of pairs of true positive rates (*i.e.*, sensitivity) and false positive rates (100%-specificity) that correspond to each possible cut-off value for the diagnostic test result. The cut-off value on the plot that is the closest to the upper left-hand corner (*i.e.*, the value
30 that encloses the largest area) is the most accurate cut-off value, and a sample generating a signal that is higher than the cut-off value determined by this method may be considered

positive. Alternatively, the cut-off value may be shifted to the left along the plot, to minimize the false positive rate, or to the right, to minimize the false negative rate. In general, a sample generating a signal that is higher than the cut-off value determined by this method is considered positive for a cancer.

5 In a related embodiment, the assay is performed in a flow-through or strip test format, wherein the binding agent is immobilized on a membrane, such as nitrocellulose. In the flow-through test, polypeptides within the sample bind to the immobilized binding agent as the sample passes through the membrane. A second, labeled binding agent then binds to the binding agent-polypeptide complex as a solution containing the second binding agent
10 flows through the membrane. The detection of bound second binding agent may then be performed as described above. In the strip test format, one end of the membrane to which binding agent is bound is immersed in a solution containing the sample. The sample migrates along the membrane through a region containing second binding agent and to the area of immobilized binding agent. Concentration of second binding agent at the area of
15 immobilized antibody indicates the presence of a cancer. Typically, the concentration of second binding agent at that site generates a pattern, such as a line, that can be read visually. The absence of such a pattern indicates a negative result. In general, the amount of binding agent immobilized on the membrane is selected to generate a visually discernible pattern when the biological sample contains a level of polypeptide that would be sufficient to
20 generate a positive signal in the two-antibody sandwich assay, in the format discussed above. Preferred binding agents for use in such assays are antibodies and antigen-binding fragments thereof. Preferably, the amount of antibody immobilized on the membrane ranges from about 25 ng to about 1 μ g, and more preferably from about 50 ng to about 500 ng. Such tests can typically be performed with a very small amount of biological sample.

25 Of course, numerous other assay protocols exist that are suitable for use with the tumor proteins or binding agents of the present invention. The above descriptions are intended to be exemplary only. For example, it will be apparent to those of ordinary skill in the art that the above protocols may be readily modified to use colon-tumor polypeptides to detect antibodies that bind to such polypeptides in a biological sample. The detection of such
30 colon tumor protein specific antibodies may correlate with the presence of a cancer.

A cancer may also, or alternatively, be detected based on the presence of T cells that specifically react with a colon tumor protein in a biological sample. Within certain methods, a biological sample comprising CD4⁺ and/or CD8⁺ T cells isolated from a patient is incubated with a colon tumor polypeptide, a polynucleotide encoding such a polypeptide and/or an APC that expresses at least an immunogenic portion of such a polypeptide, and the presence or absence of specific activation of the T cells is detected. Suitable biological samples include, but are not limited to, isolated T cells. For example, T cells may be isolated from a patient by routine techniques (such as by Ficoll/Hypaque density gradient centrifugation of peripheral blood lymphocytes). T cells may be incubated *in vitro* for 2-9 days (typically 4 days) at 37°C with one or more representative polypeptides (e.g., 5 - 25 µg/ml). It may be desirable to incubate another aliquot of a T cell sample in the absence of colon tumor polypeptide to serve as a control. For CD4⁺ T cells, activation is preferably detected by evaluating proliferation of the T cells. For CD8⁺ T cells, activation is preferably detected by evaluating cytolytic activity. A level of proliferation that is at least two fold greater and/or a level of cytolytic activity that is at least 20% greater than in disease-free patients indicates the presence of a cancer in the patient.

As noted above, a cancer may also, or alternatively, be detected based on the level of mRNA encoding a colon tumor protein in a biological sample. For example, at least two oligonucleotide primers may be employed in a polymerase chain reaction (PCR) based assay to amplify a portion of a colon tumor cDNA derived from a biological sample, wherein at least one of the oligonucleotide primers is specific for (*i.e.*, hybridizes to) a polynucleotide encoding the colon tumor protein. The amplified cDNA is then separated and detected using techniques well known in the art, such as gel electrophoresis. Similarly, oligonucleotide probes that specifically hybridize to a polynucleotide encoding a colon tumor protein may be used in a hybridization assay to detect the presence of polynucleotide encoding the tumor protein in a biological sample.

To permit hybridization under assay conditions, oligonucleotide primers and probes should comprise an oligonucleotide sequence that has at least about 60%, preferably at least about 75% and more preferably at least about 90%, identity to a portion of a polynucleotide encoding a colon tumor protein that is at least 10 nucleotides, and preferably at least 20 nucleotides, in length. Preferably, oligonucleotide primers and/or probes will

hybridize to a polynucleotide encoding a polypeptide disclosed herein under moderately stringent conditions, as defined above. Oligonucleotide primers and/or probes which may be usefully employed in the diagnostic methods described herein preferably are at least 10-40 nucleotides in length. In a preferred embodiment, the oligonucleotide primers comprise at least 10 contiguous nucleotides, more preferably at least 15 contiguous nucleotides, of a DNA molecule having a sequence recited in SEQ ID NO: 1-121, 123-197 and 205-486. Techniques for both PCR based assays and hybridization assays are well known in the art (see, for example, Mullis et al., *Cold Spring Harbor Symp. Quant. Biol.*, 51:263, 1987; Erlich ed., *PCR Technology*, Stockton Press, NY, 1989).

One preferred assay employs RT-PCR, in which PCR is applied in conjunction with reverse transcription. Typically, RNA is extracted from a biological sample, such as biopsy tissue, and is reverse transcribed to produce cDNA molecules. PCR amplification using at least one specific primer generates a cDNA molecule, which may be separated and visualized using, for example, gel electrophoresis. Amplification may be performed on biological samples taken from a test patient and from an individual who is not afflicted with a cancer. The amplification reaction may be performed on several dilutions of cDNA spanning two orders of magnitude. A two-fold or greater increase in expression in several dilutions of the test patient sample as compared to the same dilutions of the non-cancerous sample is typically considered positive.

In another embodiment, the disclosed compositions may be used as markers for the progression of cancer. In this embodiment, assays as described above for the diagnosis of a cancer may be performed over time, and the change in the level of reactive polypeptide(s) or polynucleotide evaluated. For example, the assays may be performed every 24-72 hours for a period of 6 months to 1 year, and thereafter performed as needed. In general, a cancer is progressing in those patients in whom the level of polypeptide or polynucleotide detected increases over time. In contrast, the cancer is not progressing when the level of reactive polypeptide or polynucleotide either remains constant or decreases with time.

Certain *in vivo* diagnostic assays may be performed directly on a tumor. One such assay involves contacting tumor cells with a binding agent. The bound binding agent may then be detected directly or indirectly via a reporter group. Such binding agents may

also be used in histological applications. Alternatively, polynucleotide probes may be used within such applications.

As noted above, to improve sensitivity, multiple colon tumor protein markers may be assayed within a given sample. It will be apparent that binding agents specific for different proteins provided herein may be combined within a single assay. Further, multiple primers or probes may be used concurrently. The selection of tumor protein markers may be based on routine experiments to determine combinations that results in optimal sensitivity. In addition, or alternatively, assays for tumor proteins provided herein may be combined with assays for other known tumor antigens.

DIAGNOSTIC KITS

The present invention further provides kits for use within any of the above diagnostic methods. Such kits typically comprise two or more components necessary for performing a diagnostic assay. Components may be compounds, reagents, containers and/or equipment. For example, one container within a kit may contain a monoclonal antibody or fragment thereof that specifically binds to a colon tumor protein. Such antibodies or fragments may be provided attached to a support material, as described above. One or more additional containers may enclose elements, such as reagents or buffers, to be used in the assay. Such kits may also, or alternatively, contain a detection reagent as described above that contains a reporter group suitable for direct or indirect detection of antibody binding.

Alternatively, a kit may be designed to detect the level of mRNA encoding a colon tumor protein in a biological sample. Such kits generally comprise at least one oligonucleotide probe or primer, as described above, that hybridizes to a polynucleotide encoding a colon tumor protein. Such an oligonucleotide may be used, for example, within a PCR or hybridization assay. Additional components that may be present within such kits include a second oligonucleotide and/or a diagnostic reagent or container to facilitate the detection of a polynucleotide encoding a colon tumor protein.

The following Examples are offered by way of illustration and not by way of limitation.

EXAMPLES

5

Example 1

ISOLATION AND CHARACTERIZATION OF COLON TUMOR POLYPEPTIDES BY
PCR-BASED SUBTRACTION AND MICROARRAY ANALYSIS

A cDNA library was constructed in the PCR2.1 vector (Invitrogen, Carlsbad,
10 CA) by subtracting a pool of three colon tumors with a pool of normal colon, spleen, brain,
liver, kidney, lung, stomach and small intestine using PCR subtraction methodologies
(Clontech, Palo Alto, CA). The subtraction was performed using a PCR-based protocol,
which was modified to generate larger fragments. Within this protocol, tester and driver
double stranded cDNA were separately digested with five restriction enzymes that recognize
15 six-nucleotide restriction sites (MluI, MscI, PvuII, SalI and StuI). This digestion resulted in
an average cDNA size of 600 bp, rather than the average size of 300 bp that results from
digestion with RsaI according to the Clontech protocol. This modification did not affect the
subtraction efficiency. Two tester populations were then created with different adapters, and
the driver library remained without adapters.

20 The tester and driver libraries were then hybridized using excess driver cDNA.
In the first hybridization step, driver was separately hybridized with each of the two tester
cDNA populations. This resulted in populations of (a) unhybridized tester cDNAs, (b) tester
cDNAs hybridized to other tester cDNAs, (c) tester cDNAs hybridized to driver cDNAs, and
(d) unhybridized driver cDNAs. The two separate hybridization reactions were then
25 combined, and rehybridized in the presence of additional denatured driver cDNA. Following
this second hybridization, in addition to populations (a) through (d), a fifth population (e) was
generated in which tester cDNA with one adapter hybridized to tester cDNA with the second
adapter. Accordingly, the second hybridization step resulted in enrichment of differentially
expressed sequences which could be used as templates for PCR amplification with adaptor-
30 specific primers.

The ends were then filled in, and PCR amplification was performed using
adaptor-specific primers. Only population (e), which contained tester cDNA that did not

hybridize to driver cDNA, was amplified exponentially. A second PCR amplification step was then performed, to reduce background and further enrich differentially expressed sequences.

This PCR-based subtraction technique normalizes differentially expressed cDNAs so that rare transcripts that are over-expressed in colon tumor tissue may be recoverable. Such transcripts would be difficult to recover by traditional subtraction methods.

To characterize the complexity and redundancy of the subtracted library, 96 clones were randomly picked and 65 were sequenced, as previously described. These sequences were further characterized by comparison with the most recent Genbank database (April, 1998) to determine their degree of novelty. No significant homologies were found to 21 of these clones, hereinafter referred to as 11092, 11093, 11096, 11098, 11103, 11174, 11108, 11112, 11115, 11117, 11118, 11134, 11151, 11154, 11158, 11168, 11172, 11175, 11184, 11185 and 11187. The determined cDNA sequences for these clones are provided in SEQ ID NO: 48, 49, 52, 54, 59, 60, 65-69, 79, 89, 90, 93, 99-101 and 109-111, respectively.

Two-thousand clones from the above mentioned cDNA subtraction library were randomly picked and submitted to a round of PCR amplification. Briefly, 0.5 μ l of glycerol stock solution was added to 99.5 μ l of pcr MIX (80 μ l H₂O, 10 μ l 10X PCR Buffer, 6 μ l 25 mM MgCl₂, 1 μ l 10 mM dNTPs, 1 μ l 100 mM M13 forward primer (CACGACGTTGTAAAACGACGG), 1 μ l 100 mM M13 reverse primer (CACAGGAAACAGCTATGACC), and 0.5 μ l 5 u/ml Taq polymerase (primers provided by (Operon Technologies, Alameda, CA). The PCR amplification was run for thirty cycles under the following conditions: 95°C for 5 min., 92°C for 30 sec., 57°C for 40 sec., 75°C for 2 min. and 75°C for 5 minutes.

mRNA expression levels for representative clones were determined using microarray technology (Synteni, Palo Alto, CA) in colon tumor tissues (n=25), normal colon tissues (n=6), kidney, lung, liver, brain, heart, esophagus, small intestine, stomach, pancreas, adrenal gland, salivary gland, resting PBMC, activated PBMC, bone marrow, dendritic cells, spinal cord, blood vessels, skeletal muscle, skin, breast and fetal tissues. The number of tissue samples tested in each case was one (n=1), except where specifically noted above; additionally, all the above-mentioned tissues were derived from humans. The PCR

amplification products were dotted onto slides in an array format, with each product occupying a unique location in the array. mRNA was extracted from the tissue sample to be tested, and fluorescent-labeled cDNA probes were generated by reverse transcription according to the protocol provided by Synteni. The microarrays were probed with the labeled
5 cDNA probes, the slides scanned, and fluorescence intensity was measured. This intensity correlates with the hybridization intensity.

One hundred and forty nine clones showed two or more fold over-expression in the colon tumor probe group as compared to the normal tissue probe group. These cDNA clones were further characterized by DNA sequencing with a Perkin Elmer/Applied
10 Biosystems Division Automated Sequencer Model 373A and/or Model 377 (Foster City, CA). These sequences were compared to known sequences in the most recent GenBank database. No significant homologies to human gene sequences were found in forty nine of these clones, represented by the following sixteen cDNA consensus sequences: SEQ ID NO: 2, 8, 15, 16, 22, 24, 30, 32-34, 36, 38, 40, 41, 46 and 47, hereinafter referred to as Contig 2, 8,
15 13, 14, 20, 23, 29, 31, 35, 32, 36, 38, 41, 42, 50 and 51, respectively). Contig 29 (SEQ ID NO: 30) was found to be a Rat GSK-3- β -interacting protein Axil homolog. Also, Contigs 31 and 35 (SEQ ID NO: 32 and 33, respectively) were found to be a Mus musculus GOB-4 homolog. The determined cDNA sequences of SEQ ID NO: 1, 3-7, 9-14, 17-21, 23, 25-29, 31, 35, 37, 39, 42-45, 50, 51, 53, 55-58, 61-64, 70-78, 80-88, 91, 92, 94-98, 102-108 and 112
20 were found to show some homology to previously identified genes sequences.

Microarray analysis demonstrated Contig 2 (SEQ ID NO: 2) showed over-expression in 34% of colon tumors tested, as well as increased expression in normal pancreatic tissue, with no over-expression in normal colon tissues. Upon further analysis, Contigs 2, 8 and 23 were found to share homology to the known gene GW112. Contigs 4, 5,
25 9 and 52 showed homology to carcinoembryonic antigen (SEQ ID NO: 3, 4, 5 and 6, respectively). A representative sampling of these fragments showed over-expression in 85% of colon tumors, with over-expression in normal bone marrow and 3/6 normal colon tissues. Contig 6 (SEQ ID NO: 7), showing homology to the known gene sequence for villin, and was over-expressed in about half of all colon tumors tested, with a limited degree of low level
30 over-expression in normal colon. Contig 12 (SEQ ID NO: 14), showing homology to Chromosome 17, clone hRPC.1171_I_10, also referred to as C798P, was over-expressed in

approximately 70% of colon tumors tested, with low over-expression in 1/6 normal colon samples. Contig 14, also referred to as 14261 (SEQ ID NO: 16), showing no significant homology to any known gene, showed over-expression in 44% of colon tumors tested, with low level expression in half of normal colon tissues, as well as small intestine and pancreatic tissue. Contig 18 (SEQ ID NO: 21), showing homology to the known gene for L1-cadherin, showed over-expression in approximately half of colon tumors and low level over-expression in 3/6 normal colon tissues tested. Contig 22 (SEQ ID NO: 23), showing homology to Bumetanide-sensitive Na-K-Cl cotransporter was over-expressed in 70% of colon tumors and no over-expression in all normal tissues tested. Contig 25 (SEQ ID NO: 25), showing homology to macrophage inflammatory protein-3 α , was over-expressed in over 40% of colon tumors and in activated PBMC. Contigs 26 and 48 (SEQ ID NOS: 25 and 26), showing homology to the sequence for laminin, was over-expressed in 48% of colon tumors and with low over-expression in stomach tissue. Contig 28 (SEQ ID NO: 29), showing homology to the known gene sequence for Chromosome 16 BAC clone CIT987SK-A-363E6, was over-expressed in 33% of colon tumors tested with normal stomach and 2/6 normal colon tissues showing low level over-expression. Contigs 29, 31 and 35 (SEQ ID NOS: 30, 32 and 33, respectively), also referred to as C751P, an unknown sequence showing limited and partial homology to Rat GSK-3 β -interacting protein Axil homolog and Mus musculus GOB-4 homolog, was over-expressed in 74% of colon tumors and no over-expression in all normal tissues tested. Contig 34 (SEQ ID NO: 35), showing homology to the known sequence for desmoglein 2, was over-expressed in 56% of colon tumors and showed low level over-expression in 1/6 normal colon tissues. Contig 36 (SEQ ID NO: 36), an unknown sequence also referred to as C793P, showed over-expression in 30% of colon tumor tissues tested. Contig 37 and 14287.2 (SEQ ID NOS: 37 and 116), an unknown sequence, but with limited (89%) homology to the known sequence for putative transmembrane protein was over-expressed in 70% of colon tumors, as well as in normal lung tissue and 3/6 normal colon tissues tested. Contig 38, also referred to as C796P and 14219 (SEQ ID NO: 38), showing no significant homology to any known gene, was over-expressed in 38% in colon tumors and no elevated over-expression in any normal tissues. Contig 41 (SEQ ID NO: 40), also referred to as C799P and 14308, an unknown sequence showing no significant homology to any known gene, was over-expressed in 22% of colon tumors. Contig 42, (SEQ ID NO: 41), also

referred to as C794P and 14309, an unknown sequence with no significant homology to any known gene, was over-expressed in 63% of colon tumors tested, as well as in 3/6 normal colon tissues. Contig 43 (SEQ ID NO: 42), showing homology to the known sequence for Chromosome 1 specific transcript KIAA0487 was over-expressed in 85% of colon tumors
5 tested and in normal lung and 4/6 normal colon tissues. Contig 49 (SEQ ID NO: 45), showing homology to the known sequence for pump-1, was over-expressed in 44% of colon tumors and no over-expression in all normal tissues tested. Contig 50 (SEQ ID NO: 46), also referred to as C792P and 18323, showing no significant homology to any known gene, was over-expressed in 33% of colon tumors with no detectable over-expression in any normal
10 tissues tested. Contig 51 (SEQ ID NO: 47), also referred to as C795P and 14317 was over-expressed in 11% of colon tumors.

Additional microarray analysis yielded seven clones showing two or more fold over-expression in the colon tumor probe group as compared to the normal tissue probe group. Three of these clones demonstrated particularly good colon tumor specificity, and are
15 represented by SEQ ID NO: 115, 116 and 120. Specifically, SEQ ID NO: 115, referred to as C791P or 14235, which shows homology to the known gene sequence for H. sapiens chromosome 21 derived BAC containing ets-2 gene, was over-expressed in 89% of colon tumors tested and in 5/6 normal colon tissues, as well as over-expressed at low levels in normal lung and activated PBMC. Microarray analysis for SEQ ID NO: 116 is discussed
20 above. SEQ ID NO: 120, referred to as 14295, showing homology to the known gene sequence for secreted cement gland protein XAG-2 homolog, was over-expressed in 70% of colon tumors and in 5/6 normal colon tissues, as well as low level over-expression in normal small intestine, stomach and lung. All clones showing over-expression in colon tumor were sequenced and these sequences compared to the most recent Genbank database (February 12,
25 1999). Of the seven clones, three contained sequences that did not share significant homology to any known gene sequences, represented by SEQ ID NO: 116, 117 and 119. To the best of the inventors' knowledge, none of these sequences have been previously shown to be present in colon. The determined cDNA sequences of the remaining clones (SEQ ID NO: 113-115 and 120) were found to show some homology to previously identified genes.

30 Further analysis identified a clone which was recovered several times by PCR subtraction and by expression screening using a mouse anti-scld antiserum. The determined

full length cDNA sequence for this clone is provided in SEQ ID NO: 121, with the corresponding predicted amino acid sequence being provided in SEQ ID NO: 122. This clone is homologous with the known gene Beta IG-H3, as disclosed in U.S. Patent No. 5,444,164. Microarray analysis demonstrated this clone to be over-expressed in 75 to 80% of colon tumors tested (n=27), with no over-expression in normal colon samples (n=6), but with some low level over-expression in other normal tissues tested.

Further analysis of the PCR-subtraction library described above led to the isolation of longer cDNA sequences for the clones of SEQ ID NO: 30, 115, 46, 118, 41, 47, 38, 113, 14 and 40 (known as C751P, C791P, C792P, C793P, C794P, C795P, C796P, C797P, C798P and C799P, respectively). These determined cDNA sequences are provided in SEQ ID NO: 123-132, respectively.

Using PCR subtraction methodology described above with minor modifications, transcripts from a pool of three moderately differentiated colon adenocarcinoma samples were subtracted with a set of transcripts from normal brain, pancreas, bone marrow, liver, heart, lung, stomach and small intestine. Modifications of the above protocol were included at the cDNA digestion steps and in the tester to drive hybridization ratios. In a first subtraction, the restriction enzymes PvuII, DraI, MscI and StuI were used to digest cDNAs, and the tester to driver ratio was 1:40, as suggested by Clontech. In a second subtraction, DraI, MscI and StuI were used for cDNA digestion and a tester to driver ratio of 1:76 was used. Following the PCR amplification steps, the cDNAs were clones into pCR2.1 plasmid vector. The determined cDNA sequences of 167 isolated clones are provided in SEQ ID NO: 205-371. These sequences were compared to sequences in the public databases as described above. The sequences of SEQ ID NO: 205, 207, 210-212, 214, 215, 218, 224-226, 228, 233, 234, 236, 238, 241, 242, 245, 246, 248, 250, 253, 254, 256, 259, 260, 262, 263, 266, 267, 270-273, 279, 282, 291, 293, 294, 298, 300, 302, 303, 310-313, 315, 317, 320, 322, 324, 332-335, 345, 347, 356, 358, 361, 362, 366, 369 and 371 were found to show some homology to previously identified ESTs. The remaining sequences were found to show some homology to previously identified genes.

Using the PCR subtraction technology described above, a cDNA library from a pool of primary colon tumors was subtracted with a cDNA library prepared from normal tissues, including brain, bone marrow, kidney, heart, lung, liver, pancreas, small intestine,

stomach and trachea. The determined cDNA sequences for 90 clones isolated in this subtraction are provided in SEQ ID NO: 372-461. Comparison of these sequences with those in the public databases as described above, revealed no homologies to the sequences of SEQ ID NO: 426, 445 and 453. The sequences of SEQ ID NO: 372-378, 380-404, 406, 409-417, 419-423, 425, 427-429, 433-436, 438-441, 443, 446-451, 454, 455 and 457-461 showed some
5 homology to previously identified genes, while the sequences of SEQ ID NO: 379, 405, 407, 408, 418, 424, 430-432, 437, 442, 444, 452 and 456 showed some homology to previously isolated ESTs.

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Example 2

ISOLATION OF TUMOR POLYPEPTIDES
USING SCID-PASSAGED TUMOR RNA

Human colon tumor antigens were obtained using SCID mouse passaged
15 colon tumor RNA as follows. Human colon tumor was implanted in SCID mice and harvested, as described in Patent Application Serial No. 08/556,659 filed 11/13/95, U.S. Patent No. 5,986,170 . First strand cDNA was synthesized from poly A⁺ RNA from three SCID mouse-passaged colon tumors using a Lambda ZAP Express cDNA synthesis kit (Stratagene). The reactions were pooled and digested with RNase A, T1 and H to cleave the
20 RNA and then treated with NaOH to degrade the RNA. The resulting cDNA was annealed with biotinylated (Vector Labs, Inc., Burlingame, CA) cDNA from a normal resting PBMC plasmid library (constructed from Superscript plasmid System, Gibco BRL), and subtracted with streptavidin by phenol/chloroform extraction. Second strand cDNA was synthesized from the subtracted first strand cDNA and digested with S1 nuclease (Gibco BRL). The
25 cDNA was blunted with Pfu polymerase and EcoRI adaptors (Stratagene) were ligated to the ends. The cDNA was phosphorylated with T4 polynucleotide kinase, digested with restriction endonuclease XhoI, and size selected with Sephacryl S-400 (Sigma). Fractions were pooled, ligated to Lambda ZAP Express arms (Stratagene) and packaged with Gigapack Gold III extract (Stratagene). Random plaques were picked, phagemid was excised,
30 transformed into XL0LR cells (Stratagene) and resulting plasmid DNA (Qiagen Inc., Valencia, CA) was sequenced as described above. The determined cDNA sequences for 17

clones isolated as described above are provided in SEQ ID NO: 133-151, wherein 133 and 134 represent partial sequences of a clone referred to as CoSub-3 and SEQ ID NO: 135 and 136 represent partial sequences of a clone referred to as CoSub-13. These sequences were compared with those in the public databases as described above. The sequences of SEQ ID NO: 139 and 149 showed no significant homologies to any previously identified sequences. The sequences of SEQ ID NO: 138, 140, 141, 142, 143, 148 and 149 showed some homology to previously isolated expressed sequence tags (ESTs). The sequences of SEQ ID NO: 133-137, 144-147, 150 and 151 showed some homology to previously isolated gene sequences.

10

Example 3

USE OF MOUSE ANTISERA TO IDENTIFY DNA SEQUENCES ENCODING COLON TUMOR ANTIGENS

This example illustrates the isolation of cDNA sequences encoding colon tumor antigens by screening of colon tumor cDNA libraries with mouse anti-tumor sera.

A cDNA expression library was prepared from SCID mouse-passaged human colon tumor poly A+ RNA using a Stratagene (La Jolla, CA) Lambda ZAP Express kit, following the manufacturer's instructions. Sera was obtained from the colon tumor-bearing SCID mouse. This serum was injected into normal mice to produce anti-colon tumor serum. Approximately 600,000 PFUs were screened from the unamplified library using this antiserum. Using a goat anti-mouse IgG-A-M (H+L) alkaline phosphatase second antibody developed with NBT/BCIP (BRL Labs.), positive plaques were identified. Phage was purified and phagemid excised for several clones with inserts in a pBK-CMV vector for expression in prokaryotic or eukaryotic cells.

The determined cDNA sequences for 46 of the isolated clones are provided in SEQ ID NO: 152-197. The predicted amino acid sequences for the cDNA sequences of SEQ ID NO: 187, 188, 189, 190, 194, 195 and 197 are provided in SEQ ID NO: 198-204, respectively. The determined cDNA sequences were compared with those in the public database as described above. The sequences of SEQ ID NO: 156, 168, 184, 189, 192 and 196 showed some homology to previously isolated ESTs. The sequences of SEQ ID NO: 152-

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155, 157-167, 169-182, 183, 185-188, 190, 194, 195 and 197 showed some homology to previously identified genes.

Example 4

5 ISOLATION AND CHARACTERIZATION OF COLON TUMOR POLYPEPTIDES BY CONVENTIONAL SUBTRACTION

Two cDNA libraries were constructed and used to create a subtracted cDNA library as follows.

10 Using the GibcoBRL Superscript Plasmid System with minor modifications, two cDNA libraries were created. The first library, referred to as CTCL, was prepared from a pool of mRNA samples from three colon adenocarcinoma tissue samples. Two of the samples were described as Duke's stage C and one as Duke's stage B. All three samples were grade III in histological status. A second library (referred to as DriverLibpcDNA3.1+)

15 was prepared from a pool of normal tissues, namely liver, pancreas, skin, bone marrow, resting PBMC, stomach and brain. Both libraries were prepared using the manufacturer's instructions with the following modifications: an EcoRI-NotI 5' cDNA adapter was used instead of the provided reagent; the vector pCDNA3.1(+) (Invitrogen) was substituted for the pSPORT vector; and the ligated DNA molecules were transformed into ElectroMaxDH10B

20 electrocompetent cells. Clones from the libraries were analyzed by restriction digest and sequencing to determine average insert size, quality of the library and complexity of the library. DNA was prepared from each library and digested.

The driver DNA was biotinylated and hybridized with the colon library tester DNA at a ratio of 10:1. After two rounds of hybridizations, streptavidin incubations and

25 extractions, the remaining colon cDNAs were size-selected by column chromatography and cloned into the pCMV-Script vector from Stratagene. Clones from this subtracted library (referred to as CTCL-S1) were characterized as described above for the unsubtracted libraries.

The determined cDNA sequences for 18 clones isolated from the CTCL-S1 library are provided in SEQ ID NO: 462-479. Comparison of these sequences with those in

30 the public databases, as described above, revealed no significant homologies to the sequences

of SEQ ID NO: 476, 477 and 479. The remaining sequences showed some homology to previously identified genes.

In further studies, a cDNA library was prepared from a pool of mRNA from three metastatic colon adenocarcinomas derived from liver tissue samples. All samples were described as Duke's stage D. Conventional subtraction was performed as described above, using the DriverLibpcDNA3.1+ library described above as the driver. The resulting subtracted library (referred to as CMCL-S1) was characterized by isolating a set of clones for restriction analysis and sequencing.

The determined cDNA sequences for 7 clones isolated from the CMCL-S1 library are provided in SEQ ID NO: 480-486. Comparison of these sequences with those in the public databases revealed no significant homologies to the sequence of SEQ ID NO: 483. The sequences of SEQ ID NO: 480-482 and 484-486 were found to show some homology to previously identified genes.

Example 5

SYNTHESIS OF POLYPEPTIDES

Polypeptides may be synthesized on a Perkin Elmer/Applied Biosystems Division 430A peptide synthesizer using Fmoc chemistry with HPTU (O-Benzotriazole-N,N,N',N'-tetramethyluronium hexafluorophosphate) activation. A Gly-Cys-Gly sequence may be attached to the amino terminus of the peptide to provide a method of conjugation, binding to an immobilized surface, or labeling of the peptide. Cleavage of the peptides from the solid support may be carried out using the following cleavage mixture: trifluoroacetic acid:ethanedithiol:thioanisole:water:phenol (40:1:2:2:3). After cleaving for 2 hours, the peptides may be precipitated in cold methyl-t-butyl-ether. The peptide pellets may then be dissolved in water containing 0.1% trifluoroacetic acid (TFA) and lyophilized prior to purification by C18 reverse phase HPLC. A gradient of 0%-60% acetonitrile (containing 0.1% TFA) in water (containing 0.1% TFA) may be used to elute the peptides. Following lyophilization of the pure fractions, the peptides may be characterized using electrospray or other types of mass spectrometry and by amino acid analysis.

From the foregoing it will be appreciated that, although specific embodiments of the invention have been described herein for purposes of illustration, various modifications may be made without deviating from the spirit and scope of the invention. Accordingly, the invention is not limited except as by the appended claims.

CLAIMS

1. An isolated polypeptide comprising at least an immunogenic portion of a colon tumor protein, or a variant thereof, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

(a) sequences recited in SEQ ID NO: 2, 8, 15, 16, 22, 24, 30, 32-34, 36, 38, 40, 41, 46-49, 52, 54, 59, 60, 65-69, 79, 89, 90, 93, 99-101, 109-111, 116-119, 123-132, 138-142, 143, 148, 149, 156, 168, 170-182, 184, 189, 191-193, 196, 205, 207, 210-212, 214, 215, 218, 224-226, 228, 233, 234, 236, 238, 241, 242, 245, 246, 248, 250, 253, 254, 256, 259, 260, 262, 263, 266, 267, 270-273, 279, 282, 291, 293, 294, 298, 300, 302, 303, 310-313, 315, 317, 320, 322, 324, 332-335, 345, 347, 356, 358, 361, 362, 366, 369, 371-378, 380-404, 406, 409-417, 419-423, 425, 427-429, 433-436, 438-441, 443, 446-451, 454, 455, 457-461, 476, 477, 479 and 483;

(b) sequences that hybridize to a sequence of SEQ ID NO: 2, 8, 15, 16, 22, 24, 30, 32-34, 36, 38, 40, 41, 46-49, 52, 54, 59, 60, 65-69, 79, 89, 90, 93, 99-101, 109-111, 116-119, 123-132, 138-142, 143, 148, 149, 156, 168, 170-182, 184, 189, 191-193, 196, 205, 207, 210-212, 214, 215, 218, 224-226, 228, 233, 234, 236, 238, 241, 242, 245, 246, 248, 250, 253, 254, 256, 259, 260, 262, 263, 266, 267, 270-273, 279, 282, 291, 293, 294, 298, 300, 302, 303, 310-313, 315, 317, 320, 322, 324, 332-335, 345, 347, 356, 358, 361, 362, 366, 369, 371-378, 380-404, 406, 409-417, 419-423, 425, 427-429, 433-436, 438-441, 443, 446-451, 454, 455, 457-461, 476, 477, 479 and 483 under moderately stringent conditions; and

(c) a complement of a sequence of (a) or (b).

2. An isolated polypeptide according to claim 1, wherein the polypeptide comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NO: 2, 8, 15, 16, 22, 24, 30, 32-34, 36, 38, 40, 41, 46-49, 52, 54, 59, 60, 65-69, 79, 89, 90, 93, 99-101, 109-111, 116-119, 123-132, 138-142, 143, 148, 149, 156, 168,

170-182, 184, 189, 191-193, 196, 205, 207, 210-212, 214, 215, 218, 224-226, 228, 233, 234, 236, 238, 241, 242, 245, 246, 248, 250, 253, 254, 256, 259, 260, 262, 263, 266, 267, 270-273, 279, 282, 291, 293, 294, 298, 300, 302, 303, 310-313, 315, 317, 320, 322, 324, 332-335, 345, 347, 356, 358, 361, 362, 366, 369, 371-378, 380-404, 406, 409-417, 419-423, 425, 427-429, 5 433-436, 438-441, 443, 446-451, 454, 455, 457-461, 476, 477, 479 and 483 or a complement of any of the foregoing polynucleotide sequences.

3. An isolated polypeptide comprising a sequence recited in any one of SEQ ID NO: 122 and 198-204.

10 4. An isolated polynucleotide encoding at least 15 amino acid residues of a colon tumor protein, or a variant thereof that differs in one or more substitutions, deletions, additions and/or insertions such that the ability of the variant to react with antigen-specific antisera is not substantially diminished, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide comprising a sequence recited in any one of 15 SEQ ID NO: 2, 8, 15, 16, 22, 24, 30, 32-34, 36, 38, 40, 41, 46-49, 52, 54, 59, 60, 65-69, 79, 89, 90, 93, 99-101, 109-111, 116-119, 123-132, 138-142, 143, 148, 149, 156, 168, 170-182, 184, 189, 191-193, 196, 205, 207, 210-212, 214, 215, 218, 224-226, 228, 233, 234, 236, 238, 241, 242, 245, 246, 248, 250, 253, 254, 256, 259, 260, 262, 263, 266, 267, 270-273, 279, 282, 291, 293, 294, 298, 300, 302, 303, 310-313, 315, 317, 320, 322, 324, 332-335, 345, 347, 356, 20 358, 361, 362, 366, 369, 371-378, 380-404, 406, 409-417, 419-423, 425, 427-429, 433-436, 438-441, 443, 446-451, 454, 455, 457-461, 476, 477, 479 and 483 or a complement of any of the foregoing sequences.

5. An isolated polynucleotide encoding a colon tumor protein, or a variant 25 thereof, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide comprising a sequence recited in any one of SEQ ID NO: 2, 8, 15, 16, 22, 24, 30, 32-34, 36, 38, 40, 41, 46-49, 52, 54, 59, 60, 65-69, 79, 89, 90, 93, 99-101, 109-111, 116-119, 123-132, 138-142, 143, 148, 149, 156, 168, 170-182, 184, 189, 191-193, 196, 205, 207, 210-212, 214, 215, 218, 224-226, 228, 233, 234, 236, 238, 241, 242, 245, 246, 248, 250, 253, 30 254, 256, 259, 260, 262, 263, 266, 267, 270-273, 279, 282, 291, 293, 294, 298, 300, 302, 303,

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5 6. An isolated polynucleotide comprising a sequence recited in any one of SEQ ID NO: 2, 8, 15, 16, 22, 24, 30, 32-34, 36, 38, 40, 41, 46-49, 52, 54, 59, 60, 65-69, 79, 89, 90, 93, 99-101, 109-111, 116-119, 123-132, 138-142, 143, 148, 149, 156, 168, 170-182, 184, 189, 191-193, 196, 205, 207, 210-212, 214, 215, 218, 224-226, 228, 233, 234, 236, 238, 241, 242, 245, 246, 248, 250, 253, 254, 256, 259, 260, 262, 263, 266, 267, 270-273, 279,
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 7. An isolated polynucleotide comprising a sequence that hybridizes to a
15 sequence recited in any one of SEQ ID NO: 2, 8, 15, 16, 22, 24, 30, 32-34, 36, 38, 40, 41, 46-49, 52, 54, 59, 60, 65-69, 79, 89, 90, 93, 99-101, 109-111, 116-119, 123-132, 138-142, 143, 148, 149, 156, 168, 170-182, 184, 189, 191-193, 196, 205, 207, 210-212, 214, 215, 218, 224-226, 228, 233, 234, 236, 238, 241, 242, 245, 246, 248, 250, 253, 254, 256, 259, 260, 262, 263, 266, 267, 270-273, 279, 282, 291, 293, 294, 298, 300, 302, 303, 310-313, 315, 317, 320,
20 322, 324, 332-335, 345, 347, 356, 358, 361, 362, 366, 369, 371-378, 380-404, 406, 409-417, 419-423, 425, 427-429, 433-436, 438-441, 443, 446-451, 454, 455, 457-461, 476, 477, 479 and 483 under moderately stringent conditions.

 8. An isolated polynucleotide complementary to a polynucleotide
25 according to any one of claims 4-7.

 9. An expression vector comprising a polynucleotide according to any one of claims claim 4-8.

30 10. A host cell transformed or transfected with an expression vector according to claim 9.

11. An isolated antibody, or antigen-binding fragment thereof, that specifically binds to a colon tumor protein that comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NO: 2, 8, 15, 16, 22, 24,
5 30, 32-34, 36, 38, 40, 41, 46-49, 52, 54, 59, 60, 65-69, 79, 89, 90, 93, 99-101, 109-111, 116-119, 123-132, 138-142, 143, 148, 149, 156, 168, 170-182, 184, 189, 191-193, 196, 205, 207, 210-212, 214, 215, 218, 224-226, 228, 233, 234, 236, 238, 241, 242, 245, 246, 248, 250, 253, 254, 256, 259, 260, 262, 263, 266, 267, 270-273, 279, 282, 291, 293, 294, 298, 300, 302, 303, 310-313, 315, 317, 320, 322, 324, 332-335, 345, 347, 356, 358, 361, 362, 366, 369, 371-378,
10 380-404, 406, 409-417, 419-423, 425, 427-429, 433-436, 438-441, 443, 446-451, 454, 455, 457-461, 476, 477, 479 and 483 or a complement of any of the foregoing polynucleotide sequences.

12. A fusion protein comprising at least one polypeptide according to
15 claim 1.

13. A fusion protein according to claim 12, wherein the fusion protein comprises an expression enhancer that increases expression of the fusion protein in a host cell transfected with a polynucleotide encoding the fusion protein.

20

14. A fusion protein according to claim 12, wherein the fusion protein comprises a T helper epitope that is not present within the polypeptide of claim 1.

15. A fusion protein according to claim 12, wherein the fusion protein
25 comprises an affinity tag.

16. An isolated polynucleotide encoding a fusion protein according to claim 12.

17. A pharmaceutical composition comprising a physiologically acceptable carrier and at least one component selected from the group consisting of:
30

- 5 (a) a polypeptide according to claim 1;
(b) a polynucleotide according to claim 4;
(c) an antibody according to claim 11;
(d) a fusion protein according to claim 12; and
(e) a polynucleotide according to claim 16.

18. A vaccine comprising an immunostimulant and at least one component selected from the group consisting of:

- 10 (a) a polypeptide according to claim 1;
(b) a polynucleotide according to claim 4;
(c) an antibody according to claim 11;
(d) a fusion protein according to claim 12; and
(e) a polynucleotide according to claim 16.

15 19. A vaccine according to claim 18, wherein the immunostimulant is an adjuvant.

20 20. A vaccine according to any claim 18, wherein the immunostimulant induces a predominantly Type I response.

21. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a pharmaceutical composition according to claim 17.

25 22. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a vaccine according to claim 20.

30 23. A pharmaceutical composition comprising an antigen-presenting cell that expresses a polypeptide according to claim 1, in combination with a pharmaceutically acceptable carrier or excipient.

24. A pharmaceutical composition according to claim 23, wherein the antigen presenting cell is a dendritic cell or a macrophage.

25. A vaccine comprising an antigen-presenting cell that expresses a polypeptide according to claim 1, in combination with an immunostimulant.

26. A vaccine according to claim 25, wherein the immunostimulant is an adjuvant.

27. A vaccine according to claim 25, wherein the immunostimulant induces a predominantly Type I response.

28. A vaccine according to claim 25, wherein the antigen-presenting cell is a dendritic cell.

29. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of an antigen-presenting cell that expresses a polypeptide encoded by a polynucleotide recited in any one of SEQ ID NO: 1-121, 123-197 and 205-486, and thereby inhibiting the development of a cancer in the patient.

30. A method according to claim 29, wherein the antigen-presenting cell is a dendritic cell.

31. A method according to any one of claims 21, 22 and 29, wherein the cancer is colon cancer.

32. A method for removing tumor cells from a biological sample, comprising contacting a biological sample with T cells that specifically react with a colon tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

(i) polynucleotides recited in any one of SEQ ID NO: 1-121, 123-

197 and 205-486; and

(ii) complements of the foregoing polynucleotides;

wherein the step of contacting is performed under conditions and for a time sufficient to permit the removal of cells expressing the antigen from the sample.

5

33. A method according to claim 32, wherein the biological sample is blood or a fraction thereof.

34. A method for inhibiting the development of a cancer in a patient,
10 comprising administering to a patient a biological sample treated according to the method of claim 50.

35. A method for stimulating and/or expanding T cells specific for a colon tumor protein, comprising contacting T cells with at least one component selected from the
15 group consisting of:

- (i) a polypeptide according to claim 1;
- (ii) a polypeptide encoded by a polynucleotide comprising a sequence provided in any one of SEQ ID NO: 1-121, 123-197 and 205-486;
- (iii) a polynucleotide encoding a polypeptide of (i) or (ii); and
- 20 (iv) an antigen presenting cell that expresses a polypeptide of (i) or (ii),
under conditions and for a time sufficient to permit the stimulation and/or expansion of T cells.

36. An isolated T cell population, comprising T cells prepared according to
25 the method of claim 35.

37. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a T cell population according to claim 36.

30

38. A method for inhibiting the development of a cancer in a patient,

comprising the steps of:

(a) incubating CD4⁺ and/or CD8⁺ T cells isolated from a patient with at least one component selected from the group consisting of:

- (i) a polypeptide according to claim 1;
- 5 (ii) a polypeptide encoded by a polynucleotide comprising a sequence of any one of SEQ ID NO: 1-121, 123-197 and 205-486;
- (iii) a polynucleotide encoding a polypeptide of (i) or (ii); and
- (iv) an antigen-presenting cell that expresses a polypeptide of (i) or
- 10 (ii);

such that T cells proliferate; and

(b) administering to the patient an effective amount of the proliferated T cells, and thereby inhibiting the development of a cancer in the patient.

15 39. A method for inhibiting the development of a cancer in a patient, comprising the steps of:

(a) incubating CD4⁺ and/or CD8⁺ T cells isolated from a patient with at least one component selected from the group consisting of:

- (i) a polypeptide according to claim 1;
- 20 (ii) a polypeptide encoded by a polynucleotide comprising a sequence of any one of SEQ ID NO: 1-121, 123-197 and 205-486;
- (iii) a polynucleotide encoding a polypeptide of (i) or (ii); and
- (iii) an antigen-presenting cell that expresses a polypeptide of (i) or
- 25 (ii);

such that T cells proliferate;

(b) cloning at least one proliferated cell to provide cloned T cells; and
(c) administering to the patient an effective amount of the cloned T cells, and thereby inhibiting the development of a cancer in the patient.

30

40. A method for determining the presence or absence of a cancer in a

patient, comprising the steps of:

(a) contacting a biological sample obtained from a patient with a binding agent that binds to a colon tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

5 (i) polynucleotides recited in any one of SEQ ID NO: 1-121, 123-197 and 205-486; and

(ii) complements of the foregoing polynucleotides;

(b) detecting in the sample an amount of polypeptide that binds to the binding agent; and

10 (c) comparing the amount of polypeptide to a predetermined cut-off value, and therefrom determining the presence or absence of a cancer in the patient.

41. A method according to claim 40, wherein the binding agent is an antibody.

15

42. A method according to claim 43, wherein the antibody is a monoclonal antibody.

43. A method according to claim 40, wherein the cancer is colon cancer.

20

44. A method for monitoring the progression of a cancer in a patient, comprising the steps of:

25 (a) contacting a biological sample obtained from a patient at a first point in time with a binding agent that binds to a colon tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NO: 1-121, 123-197 and 205-486 or a complement of any of the foregoing polynucleotides;

(b) detecting in the sample an amount of polypeptide that binds to the binding agent;

30 (c) repeating steps (a) and (b) using a biological sample obtained from the patient at a subsequent point in time; and

(d) comparing the amount of polypeptide detected in step (c) to the amount detected in step (b) and therefrom monitoring the progression of the cancer in the patient.

45. A method according to claim 44, wherein the binding agent is an
5 antibody.

46. A method according to claim 45, wherein the antibody is a monoclonal antibody.

10 47. A method according to claim 44, wherein the cancer is a colon cancer.

48. A method for determining the presence or absence of a cancer in a patient, comprising the steps of:

(a) contacting a biological sample obtained from a patient with an
15 oligonucleotide that hybridizes to a polynucleotide that encodes a colon tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NO: 1-121, 123-197 and 205-486 or a complement of any of the foregoing polynucleotides;

(b) detecting in the sample an amount of a polynucleotide that hybridizes
20 to the oligonucleotide; and

(c) comparing the amount of polynucleotide that hybridizes to the oligonucleotide to a predetermined cut-off value, and therefrom determining the presence or absence of a cancer in the patient.

25 49. A method according to claim 48, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a polymerase chain reaction.

50. A method according to claim 48, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a hybridization assay.

30

51. A method for monitoring the progression of a cancer in a patient,

comprising the steps of:

- (a) contacting a biological sample obtained from a patient with an oligonucleotide that hybridizes to a polynucleotide that encodes a colon tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NO: 1-121, 123-197 and 205-486 or a complement of any of the foregoing polynucleotides;
- (b) detecting in the sample an amount of a polynucleotide that hybridizes to the oligonucleotide;
- (c) repeating steps (a) and (b) using a biological sample obtained from the patient at a subsequent point in time; and
- (d) comparing the amount of polynucleotide detected in step (c) to the amount detected in step (b) and therefrom monitoring the progression of the cancer in the patient.

52. A method according to claim 51, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a polymerase chain reaction.

53. A method according to claim 51, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a hybridization assay.

54. A diagnostic kit, comprising:

- (a) one or more antibodies according to claim 11; and
- (b) a detection reagent comprising a reporter group.

55. A kit according to claim 54, wherein the antibodies are immobilized on a solid support.

56. A kit according to claim 54, wherein the detection reagent comprises an anti-immunoglobulin, protein G, protein A or lectin.

57. A kit according to claim 54, wherein the reporter group is selected

from the group consisting of radioisotopes, fluorescent groups, luminescent groups, enzymes, biotin and dye particles.

58. An oligonucleotide comprising 10 to 40 contiguous nucleotides that
5 hybridize under moderately stringent conditions to a polynucleotide that encodes a colon
tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded
by a polynucleotide sequence recited in any one of SEQ ID NO: 2, 8, 15, 16, 22, 24, 30, 32-
34, 36, 38, 40, 41, 46-49, 52, 54, 59, 60, 65-69, 79, 89, 90, 93, 99-101, 109-111, 116-119,
123-132, 138-142, 143, 148, 149, 156, 168, 170-182, 184, 189, 191-193, 196, 205, 207, 210-
10 212, 214, 215, 218, 224-226, 228, 233, 234, 236, 238, 241, 242, 245, 246, 248, 250, 253, 254,
256, 259, 260, 262, 263, 266, 267, 270-273, 279, 282, 291, 293, 294, 298, 300, 302, 303,
310-313, 315, 317, 320, 322, 324, 332-335, 345, 347, 356, 358, 361, 362, 366, 369, 371-378,
380-404, 406, 409-417, 419-423, 425, 427-429, 433-436, 438-441, 443, 446-451, 454, 455,
457-461, 476, 477, 479 and 483 or a complement of any of the foregoing polynucleotides.

15

59. A oligonucleotide according to claim 58, wherein the oligonucleotide
comprises 10-40 contiguous nucleotides recited in any one of SEQ ID NO: 2, 8, 15, 16, 22,
24, 30, 32-34, 36, 38, 40, 41, 46-49, 52, 54, 59, 60, 65-69, 79, 89, 90, 93, 99-101, 109-111,
116-119, 123-132, 138-142, 143, 148, 149, 156, 168, 170-182, 184, 189, 191-193, 196, 205,
20 207, 210-212, 214, 215, 218, 224-226, 228, 233, 234, 236, 238, 241, 242, 245, 246, 248, 250,
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303, 310-313, 315, 317, 320, 322, 324, 332-335, 345, 347, 356, 358, 361, 362, 366, 369, 371-
378, 380-404, 406, 409-417, 419-423, 425, 427-429, 433-436, 438-441, 443, 446-451, 454,
455, 457-461, 476, 477, 479 and 483.

25

60. A diagnostic kit, comprising:

- (a) an oligonucleotide according to claim 59; and
- (b) a diagnostic reagent for use in a polymerase chain reaction or
hybridization assay.

SEQUENCE LISTING

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DIAGNOSIS OF COLON CANCER AND METHODS FOR THEIR USE

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tgtctagttt	gccctctttc	cctgtgtttg	tgtcataata	gtaaaaaatc	tcttctgttc	780
tggtgtttca	tagtacgggt	ggcatacaga	acccacata	ccatgaaggc	gttagaagca	840
gatggtttat	actgcttggg	ataccaagtg	tttagcacct	gaagtgtggg	gtcattgagt	900
ttactaatca	ccatgttacc	agtgtggct	tcagttgaat	aaataaccca	caatccattc	960
tcattccacg	caaagtcaat	atcttgccaa	gcaacattag	catatgaaaa	gcggttatta	1020
taggcagcat	tagggagagt	ttgagtcaca	gcaatcgtgt	tggtgttcag	gttaactctg	1080
gcaatattcc	cggtgttgta	catgttgacg	tacatgttgt	tgttgtaaac	tgctgtacca	1140
ctaccttggg	c					1151

<210> 9
 <211> 604
 <212> DNA
 <213> Homo sapien

<220>

<221> misc_feature
 <222> (1)...(604)
 <223> n = A,T,C or G

<400> 9

ctgtgcaagg	gctttacaaa	aactgtgcca	ggacttccca	tgaggctgga	ttgcttgatt	60
catgttttat	gagccccaca	atactgaagc	tccttttcca	gggacttggc	ataggcagtc	120
aattccacat	ttgggatagg	tcctctctgg	aagtgaatgt	caggcagtga	catccaagtt	180
tctgcatgca	gtgggttaac	agccatgttt	agggggaaca	tgatttaaaa	agtacatctc	240

tctccctcct	ccccacatg	cacaaggctc	acatctcatt	atgggtgkcg	cccatgtcac	300
attaaagtgt	gatacttkgg	ttttgaaaac	attcaaacag	tctctgtgga	aatctggaga	360
gaaattggcg	gagagctgcc	gtggtgcatt	cctcctgtag	tgcttcaagn	taatgcttca	420
tcctttntta	ataacttttg	atagacaggg	gctagtcgca	cagacctctg	ggaagccctg	480
gaaaacgctg	atgcttgttt	gaagatctca	agcgcagagt	ctgcaagttc	atccccctct	540
tcctgaggtc	tgttggtg	aggctgcaga	acattggtga	tgacatggac	cacgccattt	600
gtgg						604

<210> 10
 <211> 473
 <212> DNA
 <213> Homo sapien

<400> 10	
tcgagaagat	ccctagttag
acctgctgaa	caaccacatc
tgtctgtgga	gaccttgtag
ctatcaacgg	gaaggcgatc
actacattga	tgagctactc
agtctgatgt	gtccacagcc
ctggaaagtga	gcggttgacc
cctccaattg	atgcccatac
	aaggaatttg
	cttcggaacc
	acataattaa
	aga
	60
	120
	180
	240
	300
	360
	420
	473

<210> 11
 <211> 411
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(411)
 <223> n = A,T,C or G

<400> 11	
tcctcattgg	tcggggccaa
cctgatgcag	ccacagcagc
tggtgtgtgt	tggtgatggt
gcattggtgt	cggttttyar
tggtggatct	nggatgttgg
cagctcatca	gtcaggactc
ctcaatgttt	gacattgctg
	gaccagggga
	gttccagcac
	ttctangang
	a
	60
	120
	180
	240
	300
	360
	411

<210> 12
 <211> 560
 <212> DNA
 <213> Homo sapien

<400> 12	
tacttgctcg	gagatwgcyt
caggcaagtt	gctccagagc
gcattctggat	tcctaactct
tatgtttacc	ttcaacttct
atgggtacga	gtaagcaatg
ctcctacgtt	gctgtggaca
cctgggatgc	tgcggtgcta
	taaaagaaag
	tcgctgcatg
	cttctgttgt
	ttttcatagg
	60
	120
	180
	240
	300
	360
	420

cttgcttctg atcctgctcc tgcagggtggg cgacaggtat cctaggagct gttttcaa	480
ctaagtctga tcgcattgtg aatgaaactc tctatgaaaa caciaagctt ttgagcgcca	540
caggggaaag tgaaaaacaa	560

<210> 13
 <211> 150
 <212> DNA
 <213> Homo sapien

<400> 13	
gggcaggctg tcttttttaa atgtctcggc tagctagacc acagatatct tctagacata	60
ttgaacacat ttaagatttg agggatataa gggaaaatga tatgaatgtg tatttttact	120
caaaataaaa gtaactgttt acgttggtga	150

<210> 14
 <211> 403
 <212> DNA
 <213> Homo sapien

<400> 14	
ctgctgcctg tggcgtgtgt gggctggatc ccttgaaggc tgagtttttg agggcagaaa	60
gctagctatg ggtagccagg tgttacaaag gtgctgctcc ttctccaacc cctacttggt	120
ttccctcacc ccaagcctca tgttcatacc agccagtggg ttcagcagaa cgcattgacac	180
cttatcacct cctccttgg gtgagctctg aacaccagct ttggccctc cacagtaagg	240
ctgctacatc aggggcaacc ctggctctat cattttcctt ttttgccaaa aggaccagta	300
gcataggtga gccctgagca ctaaaaggag gggtccttga agctttccca ctatagtgtg	360
gagttctgtc cctgaggtgg gtacagcagc cttggttcct ctg	403

<210> 15
 <211> 688
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(688)
 <223> n = A,T,C or G

<400> 15	
caaagcacat tttaatcatt tatttttaaaa gggggagtaa agcattttaa ctgccaatcc	60
tatagactag gacttgaaca tcaaaggaaa aatagacaaa gactagatga taaagtcatt	120
caaaagcaca gaagcacatc acatacacca gcaagggttc caactactgc actgattaac	180
tagatactct caatagcttt tctatagctc gtcctagaaa aaaaaattaa attttcattt	240
tcttacaagt tccaggctta aacaaaggca aaaattacat gcaacaactg atacactcat	300
aagttgcaca tatgtctcaa ggtctttatt agataacaat aaatgctagc actttgtcac	360
tgccatcaga ttttccttat agtccttagag tcatgtaaat aaaagttcca taatgaaatt	420
aaagaaaatt aatttttcta atcttagatc agttccatag aaaactatta atttttttaa	480
agtaggcagt agaagggggg tgggtggggg tgggaattggt tagtaagtct ggttctaate	540
ttctgagctg cctttggaag gaagttatga ggtagaagat tctactgact tttagtaagg	600
tggacaatga gagaaaagaa aaagcagggt cctcatcnc agatccttnt ggtatttatn	660
tgccangtnc nanntaatnc atanaaag	688

<210> 16
 <211> 408
 <212> DNA

<213> Homo sapien

<400> 16

caggtcatca	agatgactta	caggatgtaa	tagggagagc	tgtcgagatt	gggtgttaaaa	60
agtttatgat	tacaggtgga	aatctacaag	acagtaaaga	tgactgcat	ttggcacaaa	120
caaatgggat	gtttttcagt	acagttggat	gtcgtcctac	aagatgtggt	gaatttgaaa	180
agaataaccc	tgatctttac	ttaaaggagt	tgctaaatct	tgctgaaaac	aataaaggga	240
aagttgtggc	aataggagaa	tgccggacttg	attttgaccc	gactgcagtt	ttgtcccaaa	300
gatactcaac	tcaaatatct	tgaaaaacag	tttgaactgt	cagaacaaac	aaaattacca	360
atgtttcttc	attgtccgaa	actcacatgc	tgaatttttg	gacataat		408

<210> 17

<211> 407

<212> DNA

<213> Homo sapien

<400> 17

ggctctgggg	aggccctag	ggagcaccgt	gatggagagg	acagagcagg	ggctccagca	60
ccttctttct	ggactggcgt	tcacctccct	gctcagtgct	tgggctccac	gggcaggggt	120
cagagcactc	cctaatttat	gtgctatata	aatatgtcag	atgtacatag	agatctatct	180
tttctaaaac	attccctctc	ccactcctct	cccacagagt	gctggactgt	tccaggccct	240
ccagtgggct	gatgctggga	cccttaggat	ggggctccca	gctcctttct	cctgtgaatg	300
gaggcagaag	acctccaata	aagtgccttc	tgggcttttt	ctaacccttg	tcttagctac	360
ctgtgtactg	aaatttgggc	ctttggatcg	aatatgggtca	agagggt		407

<210> 18

<211> 405

<212> DNA

<213> Homo sapien

<400> 18

tgaagagtca	acttgggcct	ggaggactga	taaagtttgt	gattttgagg	gcctctaaaa	60
gtattaaagc	agcggcagcc	gctgcacgca	gacatgaggg	ctagggttaa	acagtaagat	120
caagttgttt	ggacagaaag	gctacagagt	gtggctcctg	ctcttggtga	agaattacga	180
ccacgctaac	catgcctagg	aaggaaagga	gttattgttt	tgtagaaagg	tgctgggggt	240
tgagagatca	gtcggacacg	attggcaggg	agagcacgtg	tgtttttatg	agaattatgc	300
ccgagatagg	taacagatga	ggaagaaatt	tgggcttgat	tgaagtaatg	ggggctgtct	360
gtgaagcttt	gcagcagtag	agcctaggta	atttgctgag	cctaa		405

<210> 19

<211> 401

<212> DNA

<213> Homo sapien

<400> 19

tcctgacatt	cctgccttct	tatattaata	agacaaataa	aacaaaatag	tgttgaagtg	60
ttggggcagc	gaaaattttt	ggggggtggt	atggagagat	aatgggcgat	gtttctcagg	120
gctgcttcaa	gcgggattag	gggcggcgtg	ggagcctaga	gtgggagaga	ttaagctgaa	180
gggaggtctt	gtggttaagg	gtgatatcat	gggatgttta	gaagaaacat	ttgtcgtata	240
gaatgattgg	tgatggcctg	gatacgggtt	tggatgattt	gagaagctaa	atggaagata	300
caaggtccga	ataaaaggag	gagaaaaatg	ggtattaaat	gtctaagaat	tgggaggacc	360
taggacatct	gattagagag	tgccaaagga	gattcagcat	a		401

<210> 20

<211> 331

<212> DNA

<213> Homo sapien

<400> 20

agggtccagct	ctgtctcata	cttgactcta	aagtcacag	cagcaagacg	ggcattgtca	60
atctgcagaa	cgatgcgggc	attgtccaca	gtatttgca	agatctgagc	cctcaggtcc	120
tcgatgatct	tgaagtaatg	gctccagtct	ctgacctggg	gtcccttctt	ctccaagtgc	180
ttccggattt	tgctctccag	cctccgggtc	tcggtctcca	ggctcctcac	tctgtccagg	240
taagaggcca	ggcggtcgtt	caggctttgc	atggtctcct	tctcgttctg	gatgcctccc	300
attcctgcc	gacccccggc	tatcccggtg	g			331

<210> 21

<211> 346

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(346)

<223> n = A,T,C or G

<400> 21

gggtccaccac	ttgtaccga	tatggacttc	cggtctctct	gtccaatgga	gccacactaa	60
agatctcacc	agtcacgtgg	tcaattttaa	gccaacctct	tgtgtctccc	ctcagtgaat	120
agcttatgtc	cagaccttct	ggatccttgg	cagtcacatt	gcccacttta	gtgcctatag	180
ctacatctc	actgactttc	gcttgggaata	cgtgttggga	aaattgaggt	gcttcattca	240
catctgtcac	aataagnctg	gaacttggca	aaagaacttg	cattgtactt	cacaccaaac	300
actagaggct	caggattttc	tgctttgaac	acaatgttgg	aaacag		346

<210> 22

<211> 360

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(360)

<223> n = A,T,C or G

<400> 22

gaagactccc	tctctcgaa	gccggatccc	gagccgggca	ggatggatca	ccaccagccg	60
gggactgggc	gctaccaggt	gcttcttaat	gaagaggata	actcagaatc	atcggctata	120
gagcagccac	ctacttcaaa	cccagcacc	gcagattgtg	caggctgcgt	cttcagcacc	180
agcacttgaa	actgactctt	ccctccacc	atatagtagt	attactgggtg	gaagtaccta	240
caacttcaga	tacagaagtt	tacggtgagt	tttatccgt	gccacctccc	tatagcgttg	300
ctacctctct	tcctacnwt	cgatgaaagc	tgagaaggct	aaagctgctg	caatggcatg	360

<210> 23

<211> 251

<212> DNA

<213> Homo sapien

<400> 23

ggcggagctc	cacgacgagc	tggaaaagga	accttttgag	gatggctttg	caaattgggga	60
agaaagtact	ccaaccagag	atgctgtggt	cacgtatact	gcagaaagta	aaggagtcgt	120

```

gaagtttggc tggatcaagg gtgtattagt acgttgtatg ttaaaccattt ggggtgtgat      180
gcttttcatt agattgtcat ggattgtggg tcaagctgga ataggtctat cagtccttgt      240
aataatgatg g                                     251

```

<210> 24

<211> 421

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(421)

<223> n = A,T,C or G

<400> 24

```

caggtctttc ccaggtgttg actccagctc cagcttcagc tccagctcca ggtcgggctc      60
cagctccagc cgcagcttar gcagcgggag gttctgtgtc ccagttgttt tccaatttca      120
ccggctcccg tggatgamcg ygggacctgy caswgctcct gktktycctgc yagsacacca      180
cnytttcccg tggacacrar kggaacckct tggaattcac agctyatgtt ctttctcara      240
agtttgagaa agaactttct aaagtgaggg aatatgtcca attaattagt gtgtatgaaa      300
agaaaactgtt aaacctaact gtccgaattg acatcatgga raaaggatac catttcttac      360
actgaactgg acttcgagct gatcaaggta gaagtgaagg agatggaaaa actggtcata      420
c                                     421

```

<210> 25

<211> 381

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(381)

<223> n = A,T,C or G

<400> 25

```

gaactttttg tttctttatt ttcaatattt gtcttattaa ttttttctt attttataat      60
gcaattacaa caatttagga nacaaaacaa tataaacaaa agaattgttaa atagtttttt      120
ttaaaaaata gcttgttgct tgcaanaaag tccatataat cttattcccc cccaaatata      180
attttatact ttgactataa ccaaaatagc ttatggaaaa ttagtattaa atagctaaac      240
acagaaaacc tacagctata aataacataa aatacagttt aactttaatg ngatgcttaa      300
acaaagcaaa ctatgatgca atatgaatca acttcattaa ttggacaagt ccagnngagg      360
cacaaattag ataagcacta a                                     381

```

<210> 26

<211> 401

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(401)

<223> n = A,T,C or G

<400> 26

```

ggaaaaagga ctggcctctc tgaagagtga gatgagggaa gtggaaggag agctggaaaag      60

```

```

gaaggagctg gagtttgaca cgaatatgga tgcagtacag atggtgatta cagaagccca 120
gaagggtgat accagaagcc aagaacgctg gggttacaat ccaagacaca ctcaacacat 180
tagacgggct cctgcattct gatggaccaa ccttttcang tggtaagatt gaagangggg 240
cctgggctta cctgggaagc aaaaactttt cccganccaa ggaaccacag attcaaccan 300
gcnacttgcg ggccaaggaa ggcanaactn ggaanaaaag gccccttaag caaaagggnc 360
accttcattt gctnggaaan cagcctttan ttggaatctt g 401

```

<210> 27

<211> 383

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (383)

<223> n = A,T,C or G

<400> 27

```

aattgcaact ggacttttat tgggcagtta cnacaacnaa tgttttcana aaaatatttg 60
gaaaaaatat accacttcat agctaagtct tacagagaan aggatttgct aataaaactt 120
aagttttgaa aattaagatg cnggtanagc ttctgaacta atgcccacag ctccaaggaa 180
nacatgtcct atttagttat tcaaatacca gttgagggca ttgtgattaa gcaaacaata 240
tatttgttan aactttgntt ttaaattact gntncttgac attacttata aaggagnctc 300
taactttcga ttctataaac tatgtaatac aaaagtatan ntttcccat tttgataaaa 360
gggccnanga tactgantag gaa 383

```

<210> 28

<211> 401

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (401)

<223> n = A,T,C or G

<400> 28

```

ggtcgcgttt cccctggctc acagtctgcc attatttgca tttttaaatg aagaaaagtt 60
taacgtggat ggatggacag tttacaatcc agtgaagaa tacaggaggc agggcttgcc 120
caatcaccat tggagaataa cttttattaa taagtgtat gagctctgag acacttacc 180
tgctcttttg gtggttccgt atcgtgcctc anatgatgac ctccggagag ttgcaacttt 240
taggtcccg aatcgaattc cagtgtgtgc atggattcat ccagaaaata agacgggtcat 300
tgtgcgttgc agtcagcctc ttgtcgggat gagggggaaa cgaaataaag atgatgagaa 360
atatctcgat gttatcaggg agactaataa acaaatttct a 401

```

<210> 29

<211> 401

<212> DNA

<213> Homo sapien

<400> 29

```

atatgagttt gccatctcca tggatgccat ttcaatgcct tcagggtaat cattctctcc 60
ccaaagactg cccacggggt catcactcct gtgacgaaat gagggctgga ttgaagatgt 120
tctgctgagc acccccctgg tcatcttttg ggtctcagaa gagccataat catgaccatt 180
ctcagcatct gaataatcag gttctctcca agtgcttggc aagttctgat tgtcctcagc 240

```

actgggtag	tctggctccc	caaaaaaggg	tggagagtta	ggttgaatgt	cagcgcttg	300
ataatcaggc	tttcccagag	agtctgcgta	tggattgatt	ctaaaacttg	tatgttccag	360
attctttctg	gatcctggat	ggttcaaatt	ggctctgggt	c		401

<210> 30
 <211> 401
 <212> DNA
 <213> Homo sapien

<400> 30						
cctgaactat	ttattaaaaa	catgaccact	cttggctatt	gaagatgctg	cctgtatttg	60
agagactgcc	atacataata	tatgacttcc	tagggatctg	aaatccataa	actaagagaa	120
actgtgtata	gcttacctga	acaggaatcc	ttactgatat	ttatagaaca	gttgatttcc	180
cccatcccca	gtttatggat	atgctgcttt	aaacttggaa	gggggagaca	ggaagtttta	240
attgttctga	ctaaacttag	gagttgagct	aggagtgcgt	tcattggtttc	ttcactaaca	300
gaggaattat	gctttgcact	acgtccctcc	aagtgaagac	agactgtttt	agacagactt	360
tttaaaatgg	tgccctacca	ttgacacatg	cagaaattgg	t		401

<210> 31
 <211> 297
 <212> DNA
 <213> Homo sapien

<400> 31						
acctccatta	atgccagggtg	ttcctcctct	gatgccagga	atgccaccag	ttatgccagg	60
catgccacct	ggattgcac	atcagagaaa	atacaccag	tcattttgcg	gtgaaaacat	120
aatgatgcca	atgggtggaa	tgatgccacc	tggaccagga	ataccacctc	tgatgcctgg	180
aatgccacca	ggtatgcccc	cacctgttcc	acgtcctgga	attcctccaa	tgactcaagc	240
acaggctgtt	tcagcgccag	gtattcttaa	tagaccacct	gcaccaacag	caactgt	297

<210> 32
 <211> 401
 <212> DNA
 <213> Homo sapien

<400> 32						
caaacctgga	gccaaaaagg	acacaaagga	ctctcgacce	aaactgcccc	agaccctctc	60
cagaggttgg	ggtgaccaac	tcattctggac	tcagacatat	gaagaagctc	tatataaatc	120
caagacaagc	aacaaaccct	tgatgattat	tcattcacttg	ggtgagtgcc	cacacagtca	180
agcttttaaag	aaagtgtttg	ctgaaaataa	agaaatccag	aaattggcag	agcagtttgt	240
cctcctcaat	ctggtttatg	aaacaactga	caaacacctt	tctcctgatg	gccagtatgt	300
ccccaggatt	atgtttgttg	acccatctct	gacagttaga	gcccgatata	actggaagat	360
attcaaaccg	tctctatgct	tacgaacctg	cagatacage	t		401

<210> 33
 <211> 401
 <212> DNA
 <213> Homo sapien

<400> 33						
agcagagga	caggaatcat	tcggccactg	ttcagacggg	agccacaccc	ttctccaate	60
caagcctggc	cccagaagat	cacaaagagc	caaagaaact	ggcaggtgtc	cacgcgtccc	120
aggccagtga	gttggtgtgc	acttactttt	tctgtgggga	agaaattcca	taccggagga	180
tgctgaaggc	tcagagcttg	accctgggcc	actttaaaga	gcagctcagc	aaaaagggaa	240
attataggta	ttacttcaaa	aaagcaagcg	atgagtttgc	ctgtggagcg	gtgtttgagg	300

```

agatctggga ggatgagacg gtgctcccga tgtatgaagg ccggattctg ggcaaagtgg      360
agcggatcga ttgagccctg gggctctggct ttggtgaact g                          401

```

```

<210> 34
<211> 401
<212> DNA
<213> Homo sapien

```

```

<400> 34
aacaatggct atgaaggcat tgtcgttgca atcgacccca atgtgccaga agatgaaaca      60
ctcattcaac aaataaagga catggtgacc caggcatctc tgtatctgtt tgaagctaca     120
ggaaagcgat tttatttcaa aaatgttgcc attttgattc ctgaaacatg gaagacaaag     180
gctgactatg tgagaccaa acttgagacc tacaaaaatg ctgatgttct ggttgcttga     240
gtctactcct ccaggtaatg atgaacccta cactgagcag atgyggcaac tgtggagaga     300
aggggtgaaa ggatcccacc tactcctga tttcattgca ggaaaaaagt tagcttgaat     360
atggaccaca aggtaagggc atttgtccat gaatggggct c                          401

```

```

<210> 35
<211> 401
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(401)
<223> n = A,T,C or G

```

```

<400> 35
catttcttcc tactagactg ccccttctgat ccactggcag aaatgatggc accaccttgt     60
cttcagggtg tgctccttca ttattccaag gatgcagcat ctctatggtg ccaggatatgg     120
gggtaaagcc tttggcgccc tttccgcaat ggcacatcag cagtaaaagt ggtaccaata     180
gcangaacag aaagggcaaa atcatgancg caattgctgc ggggtcccaag cccacatagg     240
aatcatgctg ngcttccctg canccgctgc catgcaagac actnacaaac tgnngantgta     300
aggacctgct tttcaggaca actaaaaccc tgattgnctg aaatcaggaa ctgaatttca     360
cttctcccaa gctttttctc actttgtgtc aacancacac t                          401

```

```

<210> 36
<211> 401
<212> DNA
<213> Homo sapien

```

```

<400> 36
cctgctagaa tcaactgccgc tgtgctttcg tggaaatgac agttccttgt tttttttgtt     60
tctgtttttg ttttacatta gtcattggac cacagccatt caggaactac cccctgcccc     120
acaaagaaat gaacagttgt agggagaccc agcagcacct ttcctccaca caccttcatt     180
ttgaagttcg ggtttttgtg ttaagttaat ctgtacattc tgtttgccat tgttacttgt     240
actatacatc tgtatatagt gtacggcaaa agagtattaa tccactatct ctagtgtttg     300
actttaaatc agtacagtac ctgtacctgc acggtcaccc gctccgtgtg tcgccctata     360
ttgagggctc aagctttccc ttgttttttg aaaggggttt a                          401

```

```

<210> 37
<211> 401
<212> DNA
<213> Homo sapien

```

<220>
 <221> misc_feature
 <222> (1)...(401)
 <223> n = A,T,C or G

<400> 37
 cnnctntgna atggantnnt tgnctaaaaan ganttgatga tgatgaanat ccctangang 60
 antaagcatg gancntgac ntttntctnng cactccttta cgacacggaa acangnatca 120
 ncatgatggt accaganacc ttatcaccna cgcgcacnga nctgactnat tccaaagagt 180
 tngggttacg gncatccggt cattgctcgt gccattgct gcagggctga tntactggt 240
 gcttattatg ntggccctga ggatgctcca caatgaatat aagcatgctg catgatcagc 300
 ggcaacanat gctctgccgt ttgcactaca tctttcacgg acacnatntc gaanacgggc 360
 acnttgcana gttagacttg gaatgcatgg ngccggncan n 401

<210> 38
 <211> 401
 <212> DNA
 <213> Homo sapien

<400> 38
 aattggctca ctctctcaag gcaagcactg tctcaaggca gtctcaaggc agagatgaca 60
 cagcaaaaaa cagaggggga gaaaaaagtc tattattggc ttgtgattta caaaagccaa 120
 agtccttttag ataaaaggcc aggagtcgta ccaacataga taccaaatcc aggagaacac 180
 agaccagcga taagaggggac gcttcccat gaccagacc agcctaaagc ccctgtgggg 240
 gcagccagtg gggagctgtc agaccttggg catggtggtc tttgagaatg ggtctgccct 300
 tctctccctg accagttggg atagacacct gactggaatc cttgacactg gcaggtgttt 360
 ctatgaacag agaggactgt gcctgtcttc ctgaatccca a 401

<210> 39
 <211> 401
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(401)
 <223> n = A,T,C or G

<400> 39
 tctggtangg agcaattcta ttatttggca ttgcatggct gggttgaatt aaaacaggga 60
 gtgagaacag gtgagtctag aagtccaact ctgaaaagga ccactgtaca tttgaacaca 120
 cggtgtgttt aaagatgctg ctaatgtcag tctactgggtg cactaaagga tctcttattt 180
 tatgtaaaac gttgggaatg acaagatana actgatactc tggtaagtta ccctctgaag 240
 ctacttcttg tgaaatacta atgacagcat catcctgcca agcgaaagag gcaggcataa 300
 gcaaggacaa attaaaaggg ggtaagagcc ttatcatgat gaggagtctt gttttgacat 360
 cttgggaaaa gctgtccata gtgtgaagtc gtcaatttct c 401

<210> 40
 <211> 401
 <212> DNA
 <213> Homo sapien

<400> 40
 tctggtcacc caactcttgt ggaagagggg aattgagatc gagtactgaa tatctggcag 60
 agaggctgga atccttcagc cccagagccc agggaccact ccagtagatg cagagagggg 120

```

cctgcccagg ggtcagggca gtgggtatca ctggtgacat caagaatata agggctgggg      180
aggcatcttt gtttcctggt gccctcctca aagttgctga cactttgggg acgggaaggg      240
gtagaagtag ggctgctcct tttggagctg gaggggaatag acctggagac agagttgagg      300
cagtcgggct gtccaggttc taagcatcac agcttctgca ctgggctctg aggagattct      360
cagccagagg atcccagcct cctcctccct caaatgtcaa g                                401

```

<210> 41

<211> 401

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(401)

<223> n = A,T,C or G

<400> 41

```

ctggactaaa aatgtccact atggggtgca ctctacagtt tttgaaatgc taggaggcag      60
aaggggcaga gagtataaaaa catgacctgg tagaaggaag agaggcaaaag gaaactaggt      120
ggggaggatc aattagagag gaggcacctg ggatccacct tcttccttan gtccctcct      180
ccatcagcaa aggagcactt ctctaatacat gccctcccga agactggctg ggagaagggt      240
taaaaacaaa aaatccagga gtaagagcct taggtcagtt tgaaattgga gacaaactgt      300
ctggcaaaagg gtgcganagg gagcttgtgc tcangagtc agcccgcca gcctcgggg      360
gtangtttct gaagtgtgcc attggggcct caccttctct g                                401

```

<210> 42

<211> 310

<212> DNA

<213> Homo sapien

<400> 42

```

ggttcgacaa atccccaaaa atggcaaat aagccctgtg acaaaataag ttattggatc      60
atacagaaat agcccaaatac tggaaatatt gaattaaaat tgtaatcctg taaaacaagt      120
tttgggggtga atggatttct ttaataccaa taatattttt aattcccacc acagatggat      180
ttgctgaata tgctaattgt gtgaatgaga aaacaatttt ggggtaggta taccacaag      240
taatctgatg acaaaataaa ccacagactg atgtcaaatg gacaaaaaac tgaaaatatg      300
ctgtgagaaa                                     310

```

<210> 43

<211> 401

<212> DNA

<213> Homo sapien

<400> 43

```

aggtcactta cacttgtgac cagtgtgggg cagagacctt ccagccgatc cagtctccca      60
ctttcatgcc tctgatcatg tgcccaagcc aggagtgcc aaccaaccgc tcaggagggc      120
ggctgtatct gcagacacgg ggctccagat tcatcaaatt ccaggagatg aagatgcaag      180
aacatagtga tcagggtgcct gtgggaaata tcctcgtag tatcacggtg ctggtagaag      240
gagagaacac aaggattgcc cagcctggag accacgtcag cgtcactggg attttcttgc      300
caatcctgcg cactgggttc cgacaggtgg tacagggttt actctcagaa acctacctgg      360
aagcccatcg gattgtgaag atgaacaaga gtgaggatga t                                401

```

<210> 44

<211> 401

<212> DNA

<213> Homo sapien

<400> 44

atccctgtaa	gtctattaaa	tgtaaataat	acataacttta	caacttctct	tagtcggccc	60
ttggcagatt	aaatctttgc	aaaattccat	atgtgctatt	gaaaaatgaa	ataaaacctc	120
agatgtctga	attcttattt	caaatacagt	tatataatta	ttttaaatta	caatatacaa	180
tttctgttaa	atacaactgt	taagggatcc	tgagaacaat	tataagatta	taataatata	240
tacaaactaa	cttctgaaat	gacatgggtt	gtttccttcc	cacctccta	ccctctcaaa	300
gagtttttgc	atttgcgtgt	cctgggttgc	aaaggcaaaa	gaaaatctaa	aaatagtctg	360
tgtgtgtcca	cgacatgctc	gctcctttga	gaatctcaaa	c		401

<210> 45

<211> 401

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(401)

<223> n = A,T,C or G

<400> 45

gtgcctgctg	cctggcagcc	tgccctgcc	gctgcctcag	gaggcgggag	gcatgagtga	60
gctacagtgg	gaacaggctc	aggactatct	caagagattt	tatctctatg	actcagaaac	120
aaaaaatgcc	aacagttag	aagccaaact	caaggagatg	caaaaaattc	tttggcctac	180
ctatactgga	atggtaaact	cccgcgtcat	anaaataatg	caanaagccc	agatgtggag	240
tgccagatgt	tgcagaatac	tcactatttc	caaatagccc	aaaatggact	tccaaagtgg	300
tcacctacag	gacgtatca	tatactcgag	acttaccgca	tattacagtg	gatcgattag	360
tgtcaaaggc	tttaaacatg	tggggcaaaag	agatccccct	g		401

<210> 46

<211> 401

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(401)

<223> n = A,T,C or G

<400> 46

gtcagaattg	tctttctgaa	aggaagcact	cggaatcctt	ccgaactttc	caagtccatc	60
catgattcan	agatactgcc	ttctctctct	ctgggatttt	atgtgtttct	gatagtgaat	120
tgttgatgta	tttgctactt	tgtttctttt	ctctttcaag	acttgatcat	tttatatgct	180
gnttggagaa	aaaaagaact	tttggttagca	aggaggtttc	aagaaatgat	tttggatttt	240
ctgctgcgga	atttctcggc	acctacctgt	agtatggggc	acttggtttg	gttgcagagt	300
aagaagggtg	aagaatgagc	tgtacttggg	taagcagttg	aaaccttttt	tgagcaggat	360
ctgtaaaagc	ataattgaat	ttgtttcacc	cccgtggatt	c		401

<210> 47

<211> 401

<212> DNA

<213> Homo sapien

<400> 47

```

ggctctgcagc aatgcacttc aaccatacat actgcttcca ctagctaata ccaaatgcag      60
gttctcagat ccagacaaat ggaggaaaag aacatttatg cttccgtttc agaaagccaa      120
gtcgtagttt tggcccttcc tttctctaaa gtttattccc aaaaacaggt agcattcctg      180
attgggcaga gaagaggata ttttcagccc acatctgctg caggatgtgc attttctccc      240
atcttcactg tgactagtaa agatctcacc acttctcttt ggaatttcca actttgcttg      300
tgattgaatg tcacttcgtg aatttgatt atgtcagatc acttggcatt gctcttccat      360
atgcatcaag ttgccaggca ctaaacccaa tgttcatgaa c                                401

```

<210> 48
 <211> 430
 <212> DNA
 <213> Homo sapien

```

<400> 48
acataacttg taaacttttt ctgcttgggg gctgtaacag acagaagagt aaagactaca      60
aggattttct gaagatgctt caatgaaaat catcatttcc tctttagtca tcccaagtct      120
tggtttgaaa aacttgggca tggacttata cagaccttga accaccactg acttatcatt      180
gggtggcaga ccttgaaacc aagctctctg tggtacttct gaaagtgcac caattctgat      240
ttggctaaga acagaagaca aatactggga tcgtgattct gtgttatact ctagccacag      300
catagcagct tctcgaacgg tttcttcctt ttctacattt aaattgtcac tactgagaat      360
atctatcagt aggtcatgtg acagacctgc cccggggccg gcccgctcga tgcttgccga      420
atatcatggg                                430

```

<210> 49
 <211> 57
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(57)
 <223> n = A,T,C or G

```

<400> 49
gggtattaaca atatcangca ctcattcttc ccctcttatg aaanggatna attttta      57

```

<210> 50
 <211> 327
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(327)
 <223> n = A,T,C or G

```

<400> 50
gatggnggtn tccacaagan tnaangtnen tattaantan nncttgtaga nccacttnna      60
ttaattgnnn tatgnntgnc cttctgggtg ntgtngaagc ttcatatnnt ntttggacat      120
cattacacgt cttagctctt tnaagnacaa ctttaatgct atatgaattt tgccattttt      180
gctaacactg gtatgctccn ngcatccacc atnccacntg gaattattta ttncnttcat      240
attaatnttt tgtttaccaa atctnacttg acccgaacga aactttctgn gtattttang      300
gccccnccat tcttactttt caagcct                                327

```

<210> 51

<211> 236
 <212> DNA
 <213> Homo sapien

<400> 51
 cgtctcgaag aagcgtgca ggccgatgat ggactgcacg tctgccttgt cctcagttaa 60
 cttgttgaat tgcttgaaca tgcggcccac atcctgggca aactcctgtg gggagctgta 120
 gggaggtgac aacttctcct ggaggcgggc acggatcagg gtcagatcca gggtgccacc 180
 gggctggtcc agggagaagg tggagtcgta gccagacctg cccgggcggc cgctcg 236

<210> 52
 <211> 291
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(291)
 <223> n = A,T,C or G

<400> 52
 ctccacatcct ggggccggct gtagagctgc accatgggtgc tgagcgcccc ctccagctcc 60
 ttgtatagatg aaaggacggc gaaggagctg tagtctgtgt ccacgatgcg cacgtccagg 120
 tagcccaagg cggggactct gaagttgtcc ctccggagccc accttcangt actcgggcat 180
 ccacctgggt acagccnttc gncctcggna actccatntg gactttacag gccgcccctcc 240
 tctgtgggcc tgatggncct tgcaggacat nggaacacgg gagctcnctt t 291

<210> 53
 <211> 95
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(95)
 <223> n = A,T,C or G

<400> 53
 gtctgtgcag tttctgacac ttgttgttga acatggntaa atacaatggg tatcgctgan 60
 cactaagttg tanaanttaa caaatgtgct gnttgg 95

<210> 54
 <211> 66
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(66)
 <223> n = A,T,C or G

<400> 54
 cctnaatnat ntnaatggta tcaatnnccc tgaangangg gancggngga agccggnttt 60
 gtccgg 66

<210> 55
 <211> 265
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1) ... (265)
 <223> n = A,T,C or G

<400> 55
 atctttcttc tcagtgcctt ggccttggtg agtctatctg gtaacactgg agctgactcc 60
 ctgggaagag aggccaaatg ttacaatgaa cttaatggat gcaccaagat atatgaccct 120
 gtctgtggga ctgatggaaa tacttatccc aatgaatgcc gtgttatgtt ttgaaaatc 180
 ggaaacgcca gacttctatc ctcatcctaaa aatctgggcc ttactgaaaa ccagggtttt 240
 naaaatccca ttenggtcnc cggcg 265

<210> 56
 <211> 420
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1) ... (420)
 <223> n = A,T,C or G

<400> 56
 gagcggccgc ccgggcaggt cctcgcggtg acctgatggg atttcaaaac cttggttctc 60
 agcaaggccc agatttttga atgangatag aagtctggcg ttccgattt tcaaaacata 120
 acacgcattc attgggataa gtatttccat cagtcccaca gacngggica tatatcttgg 180
 gtgcatccat taagttcntt tgtaacatt tgggcctctc ttccangg gaattcagct 240
 cccagttgtt taccaanatt naactccacc ggggccaaag gcnccttgaaa aaaaaanaa 300
 ttccctgttt accttccttg ggcttnaagt tctggcgctc aaaagttcaa ttgaaaact 360
 gcaccgcact taccacgtct cttnagaan cctggggaca cctcgycgcg gaccacgcta 420

<210> 57
 <211> 170
 <212> DNA
 <213> Homo sapien

<400> 57
 gaagcggagt tgcagcgctt ggtggccgcc gagcagcaga aggcgcagtt tactgcacag 60
 gtgcatcact tcatggagtt atgttgggat aaatgtgtgg agaagccagg gaatcgcta 120
 gactctcgca ctgaaaattg tctctccaga cctcgccgcg gaccacgcta 170

<210> 58
 <211> 193
 <212> DNA
 <213> Homo sapien

<400> 58
 attttcagtg cgagagtcta ggcgattccc tggcttctcc acacatttat cccaacataa 60
 ctccatgaag tgatgcacct gtgcagtaaa ctgcgccttc tgctgctcgg cggccaccag 120
 gcgctgcaac tccgcttcat cggcttcgcc cagctccgcc attgttcgcc acctgcccgg 180

gcggccgctc gaa 193

<210> 59
 <211> 229
 <212> DNA
 <213> Homo sapien

<400> 59
 cgcaactctc gagcatttat atacaatagc aaatcatcca gtgtgttgta cagtctataa 60
 tactccaaca gtctcccatc tgtattcaat ggcgccaccc aatacagtc tttgtttgga 120
 tgctggggag agtaatccct accccaagca ccatatagat aagaaaaccc tctccagttg 180
 agctgaacca cagacggttt gctgatacct gcccgggcgg ccgctcgaa 229

<210> 60
 <211> 340
 <212> DNA
 <213> Homo sapien

<400> 60
 tcgagcggcc gcccgggcag gtcctctaaa gatcaaaaca cccctgtcgt ccaccctcct 60
 cccactccag ggaagctgtg gtcattggtg tgtgtggaac atcagcaaac cgtctgtggt 120
 tcagctcaac tggagagggg tttcttatct atatggtgct tggggtaggg attactctcc 180
 ccagcatcca aacaaaggac tgtattgggt ggcgccattg aatacagatg ggaaactgtt 240
 ggagtattat aaactggtac aacacactgg atgatttgct attgtatata aatgctcgag 300
 aattgcggat cacctatgga cctcgccgcg gaccacgctg 340

<210> 61
 <211> 179
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(179)
 <223> n = A,T,C or G

<400> 61
 tttttgtgac ggacgnnttg agtacatgtc ccaggatcac atccagcagc tagagtggct 60
 gggacaagct ggcgngggcc aagcactgtt gaaacnatag gggctctggg gnactcgggt 120
 tnaagtgggt ggtccgantn ttnataacct tgtcngaacc nancatctcg gttgncang 179

<210> 62
 <211> 78
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(78)
 <223> n = A,T,C or G

<400> 62
 agggcggttcg taacgggaat gccgaagcgt gggaaaaagg gagcgggtggc nggaagacgg 60
 ggatgagctt angacaga 78

<210> 63
 <211> 410
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(410)
 <223> n = A,T,C or G

<400> 63
 cccagttact tggggaggct gaggcagggg gaatcctttg aacccggngg gtgggaggtt 60
 gcagtgagcc cgagatagca ccattgcact tccancatgg ggtggacaga gtgagactct 120
 atctcaaaaa aaaagaaaag aaaaggaaaag agattagatt aagattaagt acctacttcc 180
 tntcccatTT caagtcttga aaatagagga tcagaaatgt tgaggaattc tttaggatag 240
 aaagggagat gggattttac ttatggggaa agaccgcaaa taaagactgn aacttaacca 300
 cattcccaaa gtgnaagggtg ttaccaaga agtaggaacc cttttggctn ttaccttacc 360
 ttccngaaaa aaacttattn cttaaaatgg aaacccttaa agcccgggca 410

<210> 64
 <211> 199
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(199)
 <223> n = A,T,C or G

<400> 64
 cttgttctca aaaagggtcaa agggagcccg acgaggaata aatagcaatg ccctgaattc 60
 caactgacct tctacagaaa agtgcttgac tgccaagtgg tcttcccagt cattagtga 120
 gctctttagt aattctccat actcctcttg ggngangnca tnagggtttn nggcccacaa 180
 aggntggggcc tngttaagt 199

<210> 65
 <211> 125
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(125)
 <223> n = A,T,C or G

<400> 65
 agcggtagag ttctgtcctg gcacatcatc tcattgtagt atgggtcaata ggtgccatga 60
 aactcagtag cttgctaagg acatgaaacc gaagtttctc gcctttgctg gcctngtngn 120
 gggta 125

<210> 66
 <211> 204
 <212> DNA
 <213> Homo sapien

<400> 66
attcagaatt ctggcatcgg tattttctata aagtccatca gttagagcag gagcaggccc 60
ggaggggacgc cctgaagcag cgggcggaac agagcatctc tgaagagccc ggctgggagg 120
aggaggaaga ggagctcatg ggcatttcac ccatatctcc aaaagaggca aaggttcctg 180
tggacctcgg ccgcgaccac gcta 204

<210> 67
<211> 383
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(383)
<223> n = A,T,C or G

<400> 67
tcagggcctc caggcagcca gttttgcagg anattcagca cctagngtct tctgcctna 60
cgctcccaag aacctgctcc tgcaggggga acatcagaac tcgtccttga tgcaaaatg 120
gggctgggtct tnaggcttga agtccagggt agggctgcca tcctcattga gaattctccg 180
ggcagtgtan ccgacgatgg ggtatttggc tttgtacact ttggtgaaaa cctnatccag 240
ggcctccagt tccttggcgg tganaccgt antgtcatgg gtgaggtctg caggatccaa 300
ggacatcttg gctaccctc tagtggagtc cttccccgtc aaggcattgt aaggggctcc 360
tcgtccataa aactcctttt cgg 383

<210> 68
<211> 99
<212> DNA
<213> Homo sapien

<400> 68
tcacatctcc tttttttttt aactttttca aatttttgtg ttaaatagaa ggctaaaggg 60
ttagatttaa gtttctgcta cattgaccct atttaccta 99

<210> 69
<211> 37
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(37)
<223> n = A,T,C or G

<400> 69
gagaaggacn tacgncctg ntantanang aatctcc 37

<210> 70
<211> 222
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(222)

<223> n = A,T,C or G

<400> 70

```
gtgggtcatt tttgctgtca ccagcaacgt tgccacgacg aacatccttg acagacacat    60
tcttgacatt gaagcccaca ttgtcccag gaagagcttc actcaaagct tcatggcgca    120
tttcgacaga ttttacttcc gttgtaacgt tgactggagc aaaggtgacc accataccgg    180
gtttgagaac acccantcac ctgccccggg cggccgctcg aa                      222
```

<210> 71

<211> 428

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(428)

<223> n = A,T,C or G

<400> 71

```
caggagtatt ttgtagaaaa gccagaagag cattagtaga tgtatggaaa tatacggtag    60
ggcacacgct gacagtactt ttcccaagcc acgccgtatt tcttcttaca gtggtactcg    120
tcacgagctt ctccgtggac aagcaacatg gtgaaataaa ttatgtagaa ataaggcaga    180
atgtgggttaa aaccacatgg gagggaccac gccaaaggcca tgatgagatc acccaagtaa    240
ttgggggtggc gaacaaaagcc ccaccatcca gaaactagaa naatttttcc cgttgaaata    300
tgaatggntt ttaaatgtgc aagcttttga tcaactgggaa ttttcccgaa tgcctttttc    360
tganaattgc accttnggaa gantccttac cccaagnttc agaccattat ttnaaaagcn    420
ttggaact                                         428
```

<210> 72

<211> 264

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(264)

<223> n = A,T,C or G

<400> 72

```
gaataaagag cttactggaa tccagcaggg ttttctgccc aaggatttgc aagctgaagc    60
tctctgcaaa cttgatagga gagtaaaaag ccacaataga gcagtttatg aagatcttgg    120
aggagattga cacacttgat cctgccagaa aatttcaaag acagtagatt gaaaaggaaa    180
ggcttttgta aaaaaagggt caggcattcc tagccgantg tgacacagtg gagcanaaca    240
tctgcangag actgancggc tgca                      264
```

<210> 73

<211> 442

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(442)

<223> n = A,T,C or G

<400> 73

```

ggcgaatccg gcggttatca gagccatcag aaccgccacc atgacggtgg gcaagagcag      60
caagatgctg cagcatattg attacaggat gaggtgcac ctagcaggacg gccggatctt      120
cattggcacc ttcaaggctt ttgacaagca catgaatttg atcctctgtg actgtgatga      180
gttcagaaaag atcaagccaa agaacttcaa acaagcagaa agggaagaga agcagagtcct      240
cggctctgng ctgctgccaa gggagaatct ggtctcaatg acngtagaag gaccttcttc      300
caaagatact ggnattgctc gagttccact tgcctggaact tcccggggcc caaggatcgc      360
aaggcttctg gcaaaagaaa tccanacttn ggcggggacc acctaancca attcacacac      420
tggcgggcgt actagtggat cc                                         442

```

<210> 74

<211> 337

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(337)

<223> n = A,T,C or G

<400> 74

```

ggtagcagcg tctccagagc ctgatctggg gtcccagata cccaggcagc agcagccctg      60
gaggtaaagg gcaagctccc caatgtgagg ggagacccca ttcttggtca gccaggcttt      120
cagaggagat agcaggctga gggagccaac gaagaagaga ctgccancag ggggaaggact      180
gtcccgcmaa ggacagaact gattcagggg ggtcaatgct cctctagaga agagccacac      240
agaactgggg ggtccaggaa ccatgaanct tggctgtggt ctaaggagcc aggaatctgg      300
acagtgttct gggtcatacc aggattctgg aattgta                                         337

```

<210> 75

<211> 588

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(588)

<223> n = A,T,C or G

<400> 75

```

catgatgagt tctgagctac ggaggaaccc tcatttcctc aaaagtaatt tattttttaca      60
gcttctgggt tcacatgaaa ttgtttgcgc tactgagact gttactacaa actttttaag      120
acatgaaaag gcgtaatgaa aaccatcccg tcccattcc tctcctctc tgaggggactg      180
gaggggaagcc gtgcttctga ggaacaactc taattagtac acttggtgtt gtagatttac      240
actttgtatt atgtattaac atggcgtggt tatttttgta tttttctctg gttgggagta      300
tgatatgaag gatcaagatc ctcaactcac acatgtagac aaacattagc tctttactct      360
ttctcaaccc cttttatgat ttaataatt ctcaactaac taattttgta agcctgagat      420
caataagaaa tggtcaggag agangaaaga aaaaaaatat atgttcccca tttatatatta      480
gagagagacc cttantcttg cctgcaaaaa gtccaccttt catagtagta ngggccacat      540
attacattca gttgctatag gncagcactg aactgcatta cctgggca                                         588

```

<210> 76

<211> 196

<212> DNA

<213> Homo sapien

<400> 76
gcggtatcac agcctggccc ccatgtacta tcggggggcc caggctgcca tcgtggtcta 60
tgacatcacc aacacagata catttgcacg ggccaagaac tgggtgaagg agctacagag 120
gcaggccagc cccaacatcg tcattgcact cgcgggtaac aaggcagacc tggacctgcc 180
cgggcggccc ctcgaa 196

<210> 77
<211> 458
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(458)
<223> n = A,T,C or G

<400> 77
agtagagatg gggtttcact gtgttaacca ggatggtctt gatctcctgg cctcgtgatc 60
tgcccgcctc ggccctccaa agtggtggga ttacaggcgt gaaccaccgc acccggccag 120
aaatggttagt tttccctat tctctctct tttctctatt atatacttgg tcaaccagac 180
agccatccta cccanaatg gtaatgcctc ttcattcctc atatgaggga ataaaagaga 240
aaaaagcttt tggaaaacat ccacttatct aatcatccca aatatgtaat caaaagtata 300
caactcatgt gaagaataca ctggtaaaaat gttantatag gccaaaggtat cttgaattcc 360
tatatagaaa gctggtaaat gcccttttgg ctggaaccgc catcttccnn taattcnccc 420
aaaatgacca aacacaaagg gnaagangan aagccccc 458

<210> 78
<211> 464
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(464)
<223> n = A,T,C or G

<400> 78
tccgcaaatt tcctgccggc aaggtccag catttgaggg tgatgatgga ttctgtgtgt 60
ttgagagcaa cgccattgcc tactatgtga gcaatgagga gctgcgggga agtactccag 120
aggcagcagc ccagggtggtg cagtgggtga gctttgctga ttccgatata gtgccccag 180
ccagtacctg ggtgttcccc accttgggca tcatgcacca caacaaacag gccactgaga 240
atgcaaagga ggaagtgagg cgaattctgg ggctgctgga tgcttacttg aagacgagga 300
cttttctggt gggcgaacga gtgacattgg ctgacatcac agttgtctgc accctgttgt 360
ggctctataa gcaggntcta gaaccttctt ttcgcangac cttcggccgg accacgctta 420
acccaaattc cacacacttg cnggccgtac taanggaatc ccac 464

<210> 79
<211> 380
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(380)
<223> n = A,T,C or G

<400> 79
ctgtatgacc agttttttcca tctccttcac ttctaccttg atcagctcga agtccagttc 60
agtgtgaagaa atgggtatcct tctccatgat gtcaattcgg acagtttagt ttaacagttt 120
cttttcatac aactaatta attggacata ttccctcact ttanaaagtt cttttctcaaa 180
cttctganaa aagaacatga actgtgaatt ccaagcgttc ccactctgtc cacgggaaaa 240
gggtgtgtct ggcagggaaa cagaacactg gcaggtccac ggtcatccac ggagccgggtg 300
aaattgggaa aacaactggg acacagaacc tccgtgcct aagctgcggn tgggagcttg 360
gaacccgacc tggaactgga

<210> 80
<211> 360
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1) ... (360)
<223> n = A,T,C or G

<400> 80
tcgagcggcc gcccgggcag gtcctcagag agctgtttgt tncgcttctt caaaaactcc 60
tatttctccac ttctgtctaaa ggactggatg acatcaattg tgatagcaat atttgtgggt 120
gttctgtcan ncancatcgc actcctgaac aaagtagatg ttggattgga tcagtctctt 180
tccaccaga tgactcctan atgggtgatn atttcaaact catcantcag tacctgcatg 240
cgnggtccgc ctgtgtnttt tgtcctgcag gangggcncct actacacttc ttccnagggg 300
canaacatgg tgtgcngcgg ccatgggctg gcaacantga ttcnctgctg caccanatan 360

<210> 81
<211> 440
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1) ... (440)
<223> n = A,T,C or G

<400> 81
acgtggtccg gcgagtctga cctgcagata tgaactcctt gggaaacctt cattctgcct 60
cagacatact gggggcaaatt ggcttttaaaa gtctgggtca gggagccaag attacagaaa 120
nccgttgagt cnccatacat ggacactgac aaaggaaactg aagatatcca aacaagccct 180
cctggtcccg ngcctgcata aagatcggga ncggaacggt accngacgtc tgtggtcagg 240
ggttgtggaa aattggaaaa aaccagtcct gccacattg acagggaaag ctcaacggaa 300
attgaacaga tngtcttct accagtcctc cctcctggat cntgtctcgg ctcnngggan 360
tcagtgatca gtcctttcag gtggaagaag caaagaagat caacaanaag cngatcctct 420
cacctgntac cagcatatgg 440

<210> 82
<211> 264
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature

<222> (1)...(264)

<223> n = A,T,C or G

<400> 82

agcgtggtcg	cggccgangt	cctgacattc	ctgccttctt	atattaatta	tacnaataaa	60
acaaaatagt	gttgaagtgt	tggagcggcg	aaaatttttg	gggggtggta	tggacagaga	120
atgggcgatn	ttctcanggc	tgcttcaagt	gggattgggg	cngcgtggga	tcatncagtg	180
gganagattn	cnctgaccgg	antctnttgg	tanggatnat	cttgtgggga	tgtgcaagag	240
ncattcgtct	cctgaatgan	tggt				264

<210> 83

<211> 410

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(410)

<223> n = A,T,C or G

<400> 83

ancgtggtcg	cggccgangt	ccacagttgt	gggagagcca	gccattgtgg	gggcagctcc	60
acaggtaaga	ctcgtgtcct	gagcagcgca	catcatccag	gacaatgggt	cctgagccct	120
gaccaaaccg	ggcatttctt	ggggctgaca	tggcccagcc	acagcccant	tgcttcgaga	180
cgaaattggc	atcattgggtg	tcccagtant	catcacacac	ggtgccccag	gaacctccgg	240
tatangaact	ccactcggcc	tcnanacctg	tcgcctccat	tccncagcct	cagggggcaa	300
actgggattc	agatccttct	gtgggtacag	gtggtgatat	cctgacaggc	caactttctg	360
gcctgagtgt	tgactgangc	tgggcagacc	tgcccgggcg	gccgctcgaa		410

<210> 84

<211> 320

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(320)

<223> n = A,T,C or G

<400> 84

tcgaacggcc	gcccgggcag	gtctgcccc	gggtgatcca	tttgccgccc	atctctatca	60
naaggagctg	gctaccctgc	nncgacgaan	tcctgaanat	aatctcacc	ncccagatct	120
ctctgtcgca	atggagatgt	cgtcacgggt	ggncctgac	acagggcatt	ggactcagag	180
anangtnanc	acagtgtnga	agcgattgan	nnagttcagt	tgctgggtctt	acccgatntt	240
ggaaggaagg	aaaacgtggt	angacgtatc	tcgatgnant	tgaccaaanc	tgaangctnc	300
agggggcatc	gcaaaganan					320

<210> 85

<211> 218

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(218)

<223> n = A,T,C or G

<400> 85

tcgagcggcc	gcccgggcag	gtctgctgcc	cgtgctggtg	ccattgcccc	atgtgaagtc	60
actgtgccag	cccagaacac	tggctctcggg	cccagagaaga	ctcctttctc	caggctntan	120
gtatcaccac	taaaatctcc	aggggcacca	tnganatcct	gggtgtccgc	aatgttgcca	180
atgtctgtcc	gcnnattggc	taccaactg	ttgcatca			218

<210> 86

<211> 283

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(283)

<223> n = A,T,C or G

<400> 86

tcgacttctt	gtgaagggtt	tgganaaata	tgtatcagtt	cgttttat	gggtattcaa	60
taatatacct	ggtgataatg	ctgactccat	ggcttctgac	cccaaaaatt	gaccctgctg	120
ccactgggtg	tagccctgag	attgattttt	gtagccacga	ttgtttcctc	gtcctctgaa	180
gtactgggtg	tanttccttc	tgtngggcat	tcccctctgt	tgtanttccc	tctgtttgan	240
taactaccac	ggccaggaaa	aacaggggca	cgaaggtatg	gat		283

<210> 87

<211> 179

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(179)

<223> n = A,T,C or G

<400> 87

agcgtgggtc	cggccgatgt	ctttctgtgt	aagtgcataa	cactccacat	acttgacatc	60
cttcangtca	cgggccagct	nttcagcant	ctctggagtg	ataggctact	gtntgttctn	120
ggcaagtgtc	tcaanaatac	aggggtcntc	tctgagatga	ntttcagtc	cgaaccctc	179

<210> 88

<211> 512

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(512)

<223> n = A,T,C or G

<400> 88

tcgagcggcc	gcccgggcag	gtcctanacan	agaatcacca	aatttatgga	gagttaacag	60
gggtttaaca	ggaangaagt	gccttttagta	agttctcaag	ccagangctg	gaggcagcag	120
ctaaatcaga	ggacaggatc	ctcagtgaaa	gtgagccatt	cggggtggca	tgtcactcca	180
ggaataagca	caacttanaa	acaaatgatt	tcgtangata	gcacagtgc	attgggtgcac	240

ttgtgaacct	gaggccactg	tgtcaaaactg	tgcactgggt	gtgaataggg	aganccaaaa	300
attatgtcct	actgggtaat	gagctttcaa	tgggctcgat	cctctcacnc	tgaaagctct	360
gtagagcagc	tcagaaccac	aaccactccc	aacattgacc	cttctggggg	tactgtctgt	420
ggcaccacaca	ggaaggagct	ggagatcccc	attaggactg	tccaccacaca	cttgaagcca	480
caaaactgca	cctcggccgc	gaccaccgct	ta			512

<210> 89
 <211> 358
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1) ... (358)
 <223> n = A,T,C or G

<400> 89						
tcgagcgggc	cgcccgggca	ggtctgccag	tccccatccc	agacattctt	tgcattctaag	60
ctgangtctg	aactgagtgg	ggtgggctgg	tgtttccatc	ctcacaaactc	cagtgaagccg	120
ggtgtggcgg	tggcctgcgt	ctctctggcg	gttagtgatg	ttggcatcat	ccaccttttt	180
caaaacaaaa	gcaactggact	gaagaanaat	ccnccctgt	ntccaccag	tccatgggtt	240
ttaataaaaag	ggttatnnaa	gttgancaag	ncatcaccac	acacaancct	aagaacnttt	300
ttcatcnntc	cccaaaacaa	accncaccc	tgggaactcc	gggcgcgaac	cacgccta	358

<210> 90
 <211> 250
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1) ... (250)
 <223> n = A,T,C or G

<400> 90						
cgagcgggccc	cccgggcagg	tctggatggg	gagacgggact	ggaactgcgg	cttcccgtgg	60
cctgcacgca	caaggctccc	cacggccgcc	gaccttcttc	agattcgatc	gtatgtgtac	120
gcacnaagag	ccaaatattg	acattcacaa	cttcgtggga	atnttaccac	anaagactgc	180
gacccccga	tcaggcgana	gcctgagcat	agaagaacac	cgctgtgggc	ttggcactgt	240
gggncccatc						250

<210> 91
 <211> 133
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1) ... (133)
 <223> n = A,T,C or G

<400> 91						
tcgagcggcc	gnccgggcag	gtcccgggtg	gttgtttgcc	gaaatgggca	agttcntnaa	60
ncctgggaag	gtgggtgcntg	tnctggctgg	acgctactcc	ggacgcnaag	ctgtcntcgt	120
gangancatt	gat					133

<210> 92
 <211> 232
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(232)
 <223> n = A,T,C or G

<400> 92
 agcgtggctg cggccgangt ctgtcacttt gcgggggtag cggccaattc cagccaccag 60
 agcatggctg taggggcgat ctgagggtgcc atcatcaatg ttcttcacga tgacaagctt 120
 tgcgtccgga gtagcgtcca gccaggacaa gcaccacctt cccacgtntt cangaactng 180
 cccatttcgg cataaccacc cgggacctgc ccggggcggn cgtcgaaaag cc 232

<210> 93
 <211> 480
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(480)
 <223> n = A,T,C or G

<400> 93
 agcgtgggtc gcggccgang tctgtangct caccggccag agaagaccac tgtgagcatt 60
 ttgccgtata tcttgccctg ccatttggtc acttttttaa ctaaaatagg aacatccgac 120
 acacaccgtt tgcacgtct tctcccttga tattttaagc attttcccat gtcgtgagtt 180
 tctcagaaac atgtttttta caattgtact atttagtcat ngctccattta ctataattta 240
 tctgaccatt tccctactgt taaaatactt aagacgggtt ctgatttttc cactatttaa 300
 ataatgctgt gatgaatatt tttaaaatct tctgatttct tacttttttc ccccttagat 360
 gcctggaagt ggtattttga ggtgaaagag ttgttccatt ttgaanatat ttctgtctct 420
 ctctcgacct gatgtgtana cgctcacttc cagtttagcag aaccacctta gtttgtgtct 480

<210> 94
 <211> 472
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(472)
 <223> n = A,T,C or G

<400> 94
 tcgagcggnc gcccgggcag ggtctgatgt cantcacaac ttgaagggat gccaatgatg 60
 taccaatccn atgtgaaatc tctcctctta tctcctatgc tgganaaggg attacaaagt 120
 tatgtggcng ataannaatt ccatgcacct ctantcatcg atgagaatgg agttcatgan 180
 ctggggaacn atgggtatctg aaccgcgatac cangttttgt ttgccacgat angantagct 240
 tttatttttg atagaccaac tgtgaacctt ccacacgtct tggacnactg anntctaact 300
 atccncaggg ttttattttg cttgttgaac tcttncagct nttgcaaact tcccaagatc 360
 canatgactg antttcagat agcattttta tgattccan ctcattgaag gtcttatnta 420

tntcntttttt tccaagccaa ggagaccatt ggacctcggc cgcgaccacc tn 472

<210> 95
 <211> 309
 <212> DNA
 <213> Homo sapien
 <220>
 <221> misc_feature
 <222> (1)...(309)
 <223> n = A,T,C or G

<400> 95
 tcgagcggcc gcccgggcag agtgtcgagc cagcgtcgcc gcgatgggtgt tgttggagag 60
 cgagcagttc ctgacggaac tgaccagact tttccanaag tgccggacgt cgggcancgt 120
 ctatatcacc ttgaagaant atgacggtcg aaccaaacc attccaaaga aangtactgt 180
 ggangggcttt gancccgag acaacnagtg tctgttaaga actaccgatn ggaaanaana 240
 anatcagcac tgtgggtgag ctcnagggga agttaataan tttcggtatg gcttattcna 300
 acctcctta 309

<210> 96
 <211> 371
 <212> DNA
 <213> Homo sapien
 <220>
 <221> misc_feature
 <222> (1)...(371)
 <223> n = A,T,C or G

<400> 96
 tcgagcggcc gcccgggcag gtccaccact cacctactcc ccgtctctat agatttgcct 60
 gttctgggca gttctcagca atggaatcct actgtgtatc tttttgtgac tggttcttta 120
 actcagcatc acattttcaa ggttcatcca tgctgcagcc tggctccgta ctggtgacag 180
 tacttcattt ctctctccct tttgttcaga ccaaggtctc cctctgtccc caaggctaaa 240
 gtgcagttgg tgtgatcatg gctcactgca gcctcaaact cctggactca aacagtcctc 300
 ccattctcagc ctcccaaagt gctgatntta taagttgcaa gccctgcacc cagcctgtat 360
 ctccagtttg t 371

<210> 97
 <211> 430
 <212> DNA
 <213> Homo sapien
 <220>
 <221> misc_feature
 <222> (1)...(430)
 <223> n = A,T,C or G

<400> 97
 tcgancggcc gcccgggcag gttntttttt tttntttttt nnnngntagt atttaaagan 60
 atttattaaa tcatcttata accaaaatgg aaacatnttc caactagaaa catgcnacca 120
 tcatcttccc cagtcacgac ncaangtcca atatttttct tgccctctgca gataaaaagt 180
 tcnnattttt ataccactc ttactcccc ccaaaatttt aattcngtcc tnccttaaaa 240
 ttncnccggg taacaantta ccaaaatggc naaccaatta ttttaanaaa aagttgcncn 300

ttnaaaangg aaactttntg gcaantttanc ctcttttccc tccccacccc ccantttaag	360
gggaaaacaa tggcactttg ctcttgcttn aacccaaaat tgtcttccaa aaactattaa	420
aatgttnaa	430

<210> 98

<211> 307

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(307)

<223> n = A,T,C or G

<400> 98

tcnaacggcc gccnnggcnn gtctngcngc acctgtgcct canccgtcga tacctggtcg	60
attgggacan ggaanacaat ntggttttca gggaggccac anatttggag aaacggatga	120
attctccttt attccgaant cagctccttg gtctccgtag anggtgatct tgaaattctc	180
ctgttttgaa aacttttcttg aanaaacctt acctgctggg tgtatttggg ctcccactcg	240
gacaagtact cgttatccnn ggtactctta atgtgcccac gtnaactccc cgggntggca	300
actggaa	307

<210> 99

<211> 207

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(207)

<223> n = A,T,C or G

<400> 99

gtccnggacc gatgttgcn aagantttct tgggtccanta gggtcnaaaa aatgataanc	60
naggtntanc acgtgaagat ntntatanag tcttantnaa aacnctaga tctgnatgac	120
gataantcga anacnggggg aggggntgag gngagggtgg gtganggaag anntgttgat	180
aaaagannna gntgataaga anngagc	207

<210> 100

<211> 200

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(200)

<223> n = A,T,C or G

<400> 100

acntnnacta gaantaacag ncntttctang aacactacca tctgtnttca catgaaatgc	60
cacacacata naaactccaa catcaatttc attgcacaga ctgactgtaa ttaattttgt	120
cacaggaatc tatggactga atctaatgcn nccccaaatg ttgttngttt gcaatntcaa	180
acatnnttat tccancagat	200

<210> 101

```

<211> 51
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(51)
<223> n = A,T,C or G

<400> 101
tcgagcggcc gcccgggcag gtctgaccag tgganaaatg cccagttatt g      51

<210> 102
<211> 385
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(385)
<223> n = A,T,C or G

<400> 102
aacgtgggtcg cggccgaagt ccatgggtgct gggattaatc cactgtgacn gtgactctga      60
gttgagttgt ttttcaatct tctccaagcc tgtggactca tcctccacat ccttgggtag      120
taggatgaac atgctgaaga tgctnatttt gaaaagggaac tctatgaatc ttacaattga      180
atactgtcaa tgtttcccca tnacagaacg tggnccccca aggttccatc atctgcactg      240
ggtttgggtg ttctgtcttg gttgactctt gaaaagggaac atttcttttt gttttcttga      300
attcanggaa attttcttca tccactttgc ccacaaaagt taggcagcat ttaaccccca      360
anggatthttg ggtctgggtc cttcc                                     385

<210> 103
<211> 189
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(189)
<223> n = A,T,C or G

<400> 103
agcgtgggtcg cggccgaagt ctgcagcctg ggactgaccg ggaagctctg attatttacc      60
caccacaggt angttgtgtt ctgaatctca agttcacagg ttaagggtac agcatcctca      120
tcctccacgg gggtggantt gttgctgggtg atgaanggtt tggggtgggt ctgcataact      180
gttgatctc                                     189

<210> 104
<211> 181
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(181)
<223> n = A,T,C or G

```

<400> 104
 tcgagcggcc gcccgggcag gtccaggtct ccaccaangc accaccgtgg gaagctggta 60
 attgatgccc accttgaagc cmttggggca ccatccncca actggatgct gcgcttgggtt 120
 ttgatgggtg caatggcaca ttgactcttt tgggaaccac ttcaccacgg tacaacaggc 180
 a 181

<210> 105
 <211> 327
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(327)
 <223> n = A,T,C or G

<400> 105
 tcgagcggcc gcccgggcag gtcttctgtg gagtctgctg gggcatcgtg ggcagtgggg 60
 ctgccctggc cgatgctcan aaccccagcc tctttgtaaa gattctcatc gtgganatct 120
 ttggcagcgc cattggcctc tttgggggtca tcgtcgcaat tcttcanacc tccanaatga 180
 anatgggtga ctanataata tgtgtgggtg gggccgtgcc tcacttttat ttattgctgg 240
 ttttcttggg acagaactcg ggcgcgaaca cgcttanccg aattccaaca cactggcggg 300
 cgttactagt ggatccgagc tcggtac 327

<210> 106
 <211> 268
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(268)
 <223> n = A,T,C or G

<400> 106
 agcgtgggtc gggccgangt ctggcgtgtg ccacatcggt cccacctcgc tttacaaaac 60
 agtcctgaac ttnatctaataaaaattattg tacacnacat ttacattaga aaaaganagc 120
 tgggtgtang aaaccgggccc tgggtgttccc ttttaagcgaa nggtggctcca cagttggggc 180
 atcgtcgctt cctcnaagca aaaacgccaa tgaaccccnna aggggggaaaa aggaatgaag 240
 gaactgnccn gggangnccg ctccgaaa 268

<210> 107
 <211> 353
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(353)
 <223> n = A,T,C or G

<400> 107
 tcgagcggcc gcccgggcag gtggccaggc catgttatgg gatctcaacg aaggcaaaca 60
 cctttacacn ctagatgggtg gggacatcat caacgccctg tgcttcagcc ctaaccgcta 120

```

ctggctgtgt gctgccgcag gccccagcat caagatctgg gatttanagg gaaagatcnt 180
tgttnnatgaa ctgaancnta aattatcagt tccannacca ngcaaaaacc acccngtgca 240
ctccctggcc tggctctgctg atgggacctc gggcgcgaaac acgctnancc caattccanc 300
acactgggcg gncgttacta ntggatccga actcnggtac caancttggc gtt 353

```

<210> 108

<211> 360

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(360)

<223> n = A,T,C or G

<400> 108

```

agcgtggctcg cggccgaagt cctggcctca catgacctg ctccagcaac ttgaacagga 60
naagcagcag ctacatcctt aaggtccgga aagtttagatg aagatttgga tcctgcattg 120
ncctgcctcc cacctatctc tccnaatta taaacagcct ccttgggaag cagcagaatt 180
taaaaactct cccnctgccc tnttgaaacta cacaccnacc gggaaaacct tttcanaat 240
ggcacaaaaa tncnaggga tgcatttcca tgaangaana aactgggtta cccaaaatta 300
ttgggttggg gaaatccngg gggggttttt aaaaaagggc aancnccaa anaaaaaac 360

```

<210> 109

<211> 101

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(101)

<223> n = A,T,C or G

<400> 109

```

atcgtggctcn cggccgaagt cctgtgtcct ggatgggccg tgtgcancga atccgttggc 60
gactcctaac taccaanaaa angactctcg gaagaaattt c 101

```

<210> 110

<211> 300

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(300)

<223> n = A,T,C or G

<400> 110

```

ccanggaaac ccagagtcac atgagatagg gtggctttcg ggacaggggg tcagangaat 60
ggtacatgga tctcagcccc tgatggacac ggaacagggtg tggtcagaac tcccangatt 120
ctgcattccan gatccagtct ctatagaagt tatggatcat tccttcattt cattcccccc 180
ttcatgaaaa aacttctgaa caagcctttt ttctcacttt ggggccctgt ttggcncaag 240
gtnttnantt ggggaaaaaa aaacaaatcc nttccttan ccctccgtgg ggaatgacct 300

```

<210> 111

<211> 366
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(366)
 <223> n = A,T,C or G

<400> 111
 cgagcggcgg cccgggcagg tccttgtgtt gccatctgtt ancattgatt tctggaatgg 60
 aacancctttc tcaaagtttg gtcttgctan tcatgaagtc atgtcagtggt ctttaagtcac 120
 tgctgtctcac ttcccttacc aggggaatata ctgcataagt ttctgaacac ctgttttcan 180
 tattcactgt tcctctcctg cccaaaattg gaagggacct catttaaaaa tcaaatttga 240
 atcctgaaan aaaaacngga aatntttctc ttggaatttg gaatagaatt attcanttga 300
 ataacatgtt ttttccctt gccttgctct tcncanaaac atctggacct cggccgcgac 360
 acctta 366

<210> 112
 <211> 405
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(405)
 <223> n = A,T,C or G

<400> 112
 ctgactncta aacttctaata tcnatcaana taactactct ccttccgtct tncagagtgt 60
 tcacaataaaa tctgtgaatc tggcatacac agttgctgga aaattgttct tcctccacna 120
 aaaggtcaat tgttcncnc atgaaanaag ataaattgtt catccatcac tntgaaacca 180
 tccaaaacgc cggcgggaatt attnccccgt tattatgggg aacggaattt tnaataaatt 240
 tgggaangaa tggggccttt attgttttgt tttccccctt tcttggcatt gattgggccc 300
 caatgggccc cctcgctcan aanntgcccc gggggccggcc gctccaaaac cgaaattccc 360
 anccacactt ggggggcccgt tactanttgg atccgaactc ggtta 405

<210> 113
 <211> 401
 <212> DNA
 <213> Homo sapien

<400> 113
 ggatagaaga gtatatgggt ttggcaccac ggggtggata ggcaaaacat ttggttgata 60
 aggcgcagat tctgaactaa cttgtaaggc ttgtctgggt ttaggacagg taaaatgggg 120
 gaatggtaag gagagtttat aggttttagg agcccatgct gtagcaggca agtgataaca 180
 ggctttaatc ctttcaaagc atgctgtggg atgagatatt ggcatttgag cggggtaagg 240
 gtgattaggt tttaatgaga tggtaagggg tgcgatgatcc ggtccgcca ggaaggggaag 300
 tagaggatc ttatacttgt ggggttaagg tgggggggat ataagaggga ggacgcaaaa 360
 ggaggccttg gattaggaat aaggggccc aatgagatgc a 401

<210> 114
 <211> 401
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(401)
 <223> n = A,T,C or G

<400> 114
 angtcacag gangcangag gccaggctcc gtcccancca gtccatgatg ttgaagagga 60
 ggaagcagca catgggggtg aagaactgac tccacttccc aggactgggtg gagctgggtca 120
 ccatggctgt ggtggcgggg aagacggaca gggtgacttc tggaagacag tgaagactga 180
 aggttttctt ggcttctggg gctcatctgg ctctgattcc ggctccttct ccagggtcaag 240
 atccagggtt cagagctact ttcttggggg actactnggg aatcccgttc tcatctgggg 300
 gtngaggggg gacggggnaa gggncatgct tgtgaccag gtttcccacc tcggcccgcg 360
 accacgctaa ggcccgaatt ncagcacact tggcgggccg t 401

<210> 115
 <211> 401
 <212> DNA
 <213> Homo sapien

<400> 115
 atccctgtaa gtctattaaa tgtaaataat acatacttta caacttctct tagtcggccc 60
 ttggcagatt aaatctttgc aaaattccat atgtgctatt gaaaaatgaa ataaaacctc 120
 agatgtctga attcttattt caaatacagt tatataatta ttttaaatta caatatacaa 180
 tttctgtaa atacaactgt taagggatcc tgagaacaat tataagatta taataatata 240
 taaaaactaa cttctgaaat gacatgggtt gtttccttcc caccctccta ccctctcaaa 300
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 tgtgtgtcca cgacatgctc gtccttttga gaatctcaaa c 401

<210> 116
 <211> 301
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(301)
 <223> n = A,T,C or G

<400> 116
 ngatttaatt gnnagcttct ttttaatgga atnnttggct aaaatgaatt gatgattatg 60
 aatatcccta ggaggagtta gcatggannn tgatcatttt cttngnactc ctttangaca 120
 nggaaacagg natcagcatg anggtanacan aaaccttatn accnangcgc acganctgac 180
 ttcttccaaa gagttgnggt tccgggcagc ggtcattgcc gtgcccattg ctggagggtc 240
 gattctagtg ntgcttatta tgctggccct gaggatgctt ccaanatgaa aataagangc 300
 t 301

<210> 117
 <211> 383
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(383)

<223> n = A,T,C or G

<400> 117

```
aattgcaact ggacttttat tgggcagtta cnacaacnaa tgttttcana aaaatatttg      60
gaaaaaatat accacttcat agctaagtct tacagagaan aggatttgct aataaaactt      120
aagttttgaa aattaagatg cnggtanagc ttctgaacta atgcccacag ctccaaggaa      180
necatgtcct atttagttat tcaaatacca gttgagggca ttgtgattaa gcaaacaata      240
tatttggtan aactttgntt ttaaattact gntncttgac attacttata aaggagnctc      300
taactttcga tttctaaaac tatgtaatac aaaagtatan ntttcccat tttgataaaa      360
gggccnanga tactgantag gaa                                           383
```

<210> 118

<211> 301

<212> DNA

<213> Homo sapien

<400> 118

```
ctgctagaat cactgccgct gtgctttcgt ggaaatgaca gttccttggt ttttttggtt      60
ctgtttttgt tttacattag tcattggacc acagccattc aggaactacc cctgccccca      120
caaagaaatg aacagttgta gggagaccca gcagcacctt tcctccacac accttcattt      180
tgaagttcgg gtttttggtg taagttaatc tgtacattct gtttgccatt gttacttgta      240
ctatacatct gtatatagtg tacggcaaaa gagtattaat ccactatctc tagtgcttga      300
c                                           301
```

<210> 119

<211> 401

<212> DNA

<213> Homo sapien

<400> 119

```
taaggacatg gacccccggc tgattgcatg gaaaggaggg gcagtgttgg cttgtttgga      60
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acgagagcgg gctgcgtttg tgtggtgaat ggggaggaaa tgtcactgcc gaagacccaa      180
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gatgcttaag tgtcatggac agtaaatgaa tttgaacttt atgtttgagg acatgacatt      300
gggtttgaaa atataaactg cttttgagca gtttaagtca gggcatttga gaataaaaata      360
ggaactttct cttcagtttg taaaactctc ttgcctctc t                                           401
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<210> 120

<211> 301

<212> DNA

<213> Homo sapien

<400> 120

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ctgccccaga ccctctccag aggttggggt gaccaactca tctggactca gacatatgaa      120
gaagctctat ataaatccaa gacaagcaac aaacccttga tgattattca tcaacttgggt      180
gagtgtccac acagtcaagc tttaaagaaa gtgtttgctg aaaataaaga aatccagaaa      240
ttggcagagc agtttgtcct cctcaatctg gtttatgaaa caactgacaa acacctttct      300
c                                           301
```

<210> 121

<211> 2691

<212> DNA

<213> Homo sapien

<400> 121

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ctcatgggaa	gtcctggcac	agtttttgta	aagcccttgc	acagctggag	aaatggcatc	2520
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aggcttttat	ggggccctgt	ccaggtagaa	aagaaatggt	atgtagagct	tagatttccc	2640
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<210> 122

<211> 683

<212> PRT

<213> Homo sapien

<400> 122

Met Ala Leu Phe Val Arg Leu Leu Ala Leu Ala Leu Ala Leu

1	5	10	15
Gly Pro Ala	Ala Thr Leu Ala Gly	Pro Ala Lys Ser Pro	Tyr Gln Leu
20	25	30	
Val Leu Gln	His Ser Arg Leu Arg	Gly Arg Gln His Gly	Pro Asn Val
35	40	45	
Cys Ala Val	Gln Lys Val Ile Gly	Thr Asn Arg Lys Tyr	Phe Thr Asn
50	55	60	
Cys Lys Gln	Trp Tyr Gln Arg Lys	Ile Cys Gly Lys Ser	Thr Val Ile
65	70	75	80
Ser Tyr Glu	Cys Cys Pro Gly Tyr	Glu Lys Val Pro Gly	Glu Lys Gly
85	90	95	
Cys Pro Ala	Ala Leu Pro Leu Ser	Asn Leu Tyr Glu Thr	Leu Gly Val
100	105	110	
Val Gly Ser	Thr Thr Thr Gln Leu	Tyr Thr Asp Arg Thr	Glu Lys Leu
115	120	125	
Arg Pro Glu	Met Glu Gly Pro Gly	Ser Phe Thr Ile Phe	Ala Pro Ser
130	135	140	
Asn Glu Ala	Trp Ala Ser Leu Pro	Ala Glu Val Leu Asp	Ser Leu Val
145	150	155	160
Ser Asn Val	Asn Ile Glu Leu Leu	Asn Ala Leu Arg Tyr	His Met Val
165	170	175	
Gly Arg Arg	Val Leu Thr Asp Glu	Leu Lys His Gly Met	Thr Leu Thr
180	185	190	
Ser Met Tyr	Gln Asn Ser Asn Ile	Gln Ile His His Tyr	Pro Asn Gly
195	200	205	
Ile Val Thr	Val Asn Cys Ala Arg	Leu Leu Lys Ala Asp	His His Ala
210	215	220	
Thr Asn Gly	Val Val His Leu Ile	Asp Lys Val Ile Ser	Thr Ile Thr
225	230	235	240
Asn Asn Ile	Gln Gln Ile Ile Glu	Ile Glu Asp Thr Phe	Glu Thr Leu
245	250	255	
Arg Ala Ala	Val Ala Ala Ser Gly	Leu Asn Thr Met Leu	Glu Gly Asn
260	265	270	
Gly Gln Tyr	Thr Leu Leu Ala Pro	Thr Asn Glu Ala Phe	Glu Lys Ile
275	280	285	
Pro Ser Glu	Thr Leu Asn Arg Ile	Leu Gly Asp Pro Glu	Ala Leu Arg
290	295	300	
Asp Leu Leu	Asn Asn His Ile Leu	Lys Ser Ala Met Cys	Ala Glu Ala
305	310	315	320
Ile Val Ala	Gly Leu Ser Val Glu	Thr Leu Glu Gly Thr	Thr Leu Glu
325	330	335	
Val Gly Cys	Ser Gly Asp Met Leu	Thr Ile Asn Gly Lys	Ala Ile Ile
340	345	350	
Ser Asn Lys	Asp Ile Leu Ala Thr	Asn Gly Val Ile His	Tyr Ile Asp
355	360	365	
Glu Leu Leu	Ile Pro Asp Ser Ala	Lys Thr Leu Phe Glu	Leu Ala Ala
370	375	380	
Glu Ser Asp	Val Ser Thr Ala Ile	Asp Leu Phe Arg Gln	Ala Gly Leu
385	390	395	400
Gly Asn His	Leu Ser Gly Ser Glu	Arg Leu Thr Leu Leu	Ala Pro Leu
405	410	415	
Asn Ser Val	Phe Lys Asp Gly Thr	Pro Pro Ile Asp Ala	His Thr Arg
420	425	430	
Asn Leu Leu	Arg Asn His Ile Ile	Lys Asp Gln Leu Ala	Ser Lys Tyr
435	440	445	

Leu Tyr His Gly Gln Thr Leu Glu Thr Leu Gly Gly Lys Lys Leu Arg
 450 455 460
 Val Phe Val Tyr Arg Asn Ser Leu Cys Ile Glu Asn Ser Cys Ile Ala
 465 470 475 480
 Ala His Asp Lys Arg Gly Arg Tyr Gly Thr Leu Phe Thr Met Asp Arg
 485 490 495
 Val Leu Thr Pro Pro Met Gly Thr Val Met Asp Val Leu Lys Gly Asp
 500 505 510
 Asn Arg Phe Ser Met Leu Val Ala Ala Ile Gln Ser Ala Gly Leu Thr
 515 520 525
 Glu Thr Leu Asn Arg Glu Gly Val Tyr Thr Val Phe Ala Pro Thr Asn
 530 535 540
 Glu Ala Phe Arg Ala Leu Pro Pro Arg Glu Arg Ser Arg Leu Leu Gly
 545 550 555 560
 Asp Ala Lys Glu Leu Ala Asn Ile Leu Lys Tyr His Ile Gly Asp Glu
 565 570 575
 Ile Leu Val Ser Gly Gly Ile Gly Ala Leu Val Arg Leu Lys Ser Leu
 580 585 590
 Gln Gly Asp Lys Leu Glu Val Ser Leu Lys Asn Asn Val Val Ser Val
 595 600 605
 Asn Lys Glu Pro Val Ala Glu Pro Asp Ile Met Ala Thr Asn Gly Val
 610 615 620
 Val His Val Ile Thr Asn Val Leu Gln Pro Pro Ala Asn Arg Pro Gln
 625 630 635 640
 Glu Arg Gly Asp Glu Leu Ala Asp Ser Ala Leu Glu Ile Phe Lys Gln
 645 650 655
 Ala Ser Ala Phe Ser Arg Ala Ser Gln Arg Ser Val Arg Leu Ala Pro
 660 665 670
 Val Tyr Gln Lys Leu Leu Glu Arg Met Lys His
 675 680

<210> 123

<211> 1205

<212> DNA

<213> Homo sapien

<400> 123

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 cgctccaggc cagtgaattg gttgtcactt actttttctg tggggaagaa attccatacc 180
 ggaggatgct gaaggctcag agcttgaccc tgggccactt taaagagcag ctcagcaaaa 240
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 aagtggagcg gatcgattga gccctgcggt ctggcttttg tgaactgttg gagcccgaag 420
 ctcttgtgaa ctgtcttggc tgtgagcaac tgcgacaaaa cathttgaag gaaaattaaa 480
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 gaggttgatt ttcattgatt atgagctggg tactgactga gataagaaaa gctgaacta 600
 ttattataaa acatgaccac tcttggttat tgaagatgct gcctgtattt gagagactgc 660
 catacataat atatgacttc ctagggatct gaaatccata aactaagaga aactgtgtat 720
 agcttacctg aacaggaatc ctactgata tttatagaac agttgatttc ccccatcccc 780
 agtttatgga tatgctgctt taaacttgga agggggagac aggaagtttt aattgttctg 840
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 tgctttgcac tacgtccctc caagtgaaga cagactgttt tagacagact ttttaaaatg 960
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gttggtgttg	atgggatgat	ctgttcgaga	gggagaggca	gggaaccctg	ctccttcggg	1140
ccccagggtg	atcctgtgac	tgaggctccc	cctcatgtag	cctccccagg	cccaggggccc	1200
tgagg						1205

<210> 124
 <211> 583
 <212> DNA
 <213> Homo sapien

<400> 124						
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agaggcacca	ggaagccgtc	ctggcgcttg	gcagtccttg	ggacgggatg	gttctggctg	180
tttgagattc	tcaaaggagc	gagcatgtcg	tggacacaca	cagactattt	ttagattttc	240
ttttgccttt	tgaaccagg	aacagcaaat	gcaaaaactc	tttgagaggg	taggagggtg	300
ggaaggaaac	aaccatgtca	tttcagaagt	tagtttgtat	atattattat	aattttataa	360
ttgtttctcg	aattccctta	cagttgtatt	taacagaaat	tgtatattgt	aattttaaaat	420
aattatataa	ctgtatttga	aataagaatt	cagacatctg	aggttttatt	tcatttttca	480
atagcacata	tgaatttttg	caaagattta	atctgccaag	ggccgactaa	gagaagttgt	540
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<210> 125
 <211> 783
 <212> DNA
 <213> Homo sapien

<400> 125						
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cctttctcta	aagtttattc	ccaaaaacag	gtagcattcc	tgattgggca	gagaagagga	180
tatttttcagc	ccacatctgc	tgcaggatat	tcattttctc	ccatcttcac	tgtgactagt	240
aaagatctca	ccacttctct	ttggaatttc	caactttgct	tgtgattgaa	tgctacttcg	300
tgaatttgta	ttatgtcaga	tcacttggca	ttgtctctcc	atatgcatca	agttgccagg	360
cactgttgcg	ctgtcggggc	cactggaatc	cacgggggtg	aaacaaattc	aattatgctt	420
ttacagatcc	tgctcaaaaa	aggtttcaac	tgcttaacca	agtagagctc	attcttccac	480
cttcttactc	tgaaccacaa	ccaagtgtcc	catactacag	gtaggtgtcg	agaaattccg	540
cagcagaaaa	tccaaaatca	tttctgaaac	ctccttgcta	acaaaagtcc	tttttttctc	600
caaacagcat	ataaaatgat	caagtcttga	aagagaaaag	aagcaaagta	gcaaatacat	660
caacaattca	ctatcagaaa	cacataaaat	cccagagaga	gagaaggcag	tatctctgaa	720
tcattggatg	acttggaag	ttcggaagga	ttccgagtgc	ttcctttcag	aaagacaatt	780
ctg						783

<210> 126
 <211> 604
 <212> DNA
 <213> Homo sapien

<400> 126						
cctgctagaa	tcactgccgc	tgtgctttcg	tggaaatgac	agttccttgt	tttttttgtt	60
tctgtttttg	ttttacatta	gtcattggac	cacagccatt	caggaactac	cccctgcccc	120
acaaagaaat	gaacagttgt	agggagaccc	agcagcacct	ttcctccaca	caccttcatt	180
ttgaagttcg	ggtttttgtg	ttaaagttaa	tctgtacatt	ctgtttgcca	ttgttacttg	240
tactatacat	ctgtatatag	tgtacggcaa	aagagtatta	atccactatc	tctagtgtct	300
gacttttaaat	cagtacagta	cctgtacctg	cacggtcacc	cgctccgtgt	gtcgccctat	360
attgagggct	caagctttcc	cttgtttttt	gaaaggggtt	tatgtataaa	tatattttat	420

gcctttttat	tacaagtctt	gtactcaatg	acttttgtca	tgacattttg	ttctacttat	480
actgtaaatt	atgcattata	aagagttcat	ttaaggaaaa	ttacttggtg	caataattat	540
tgtaatav	agatgtagcc	tttattaaaa	ttttatattt	ttcaaaaaaa	aaaaaaaaaa	600
aaaa						604

<210> 127

<211> 417

<212> DNA

<213> Homo sapien

<400> 127

ctgagcctct	gtcaccagag	aaggctgagg	ccccaatggc	acacctcaga	aacctacacc	60
ccgaggctgg	acggctggac	tcctgagcac	aagctccctc	tcgcaccctt	tgccagacag	120
tttgtctcca	atttcaaact	gacctaaagg	tcttactcct	ggattttttg	tttttaaacc	180
ttctcccagc	cagtcttcgg	gagggcatga	ttagagaagt	gctcctttgc	tgatggagga	240
ggggacctaa	ggaagaagg	ggatcccagg	tgccctcctc	ctaattgatc	ctccccacct	300
agtttccttt	gcctctcttc	cttctaccag	gtcatgtttt	ttactctctg	ccccttctgc	360
ctcctagcat	ttcaaaaact	gtagagtgc	cccatagtg	gacattttta	gtccagg	417

<210> 128

<211> 657

<212> DNA

<213> Homo sapien

<400> 128

ccacactgaa	atgcagttaa	atgtggaaac	ttttctaaat	acatattgta	gcatctttgg	60
acatcaacgt	gtggcctgaa	atttttatta	ttgttccctc	ttctcctcca	ttaaaaaaaa	120
aatctccttg	tggtatttag	tcattttacca	ttaacacata	ttatggctta	aaaagggcca	180
tccttccctt	ttctgagctg	gagttcttca	cgctcacctt	tgatgcatgg	ccttagctgg	240
ttactttgcc	ttggtttgg	catgaacatt	gggttagtg	gcctggcaac	ttgaatgcat	300
atggaaagaa	caatgccaag	tgatctgaca	taatacaaat	tccgaagtga	cattcaatca	360
caagcaaagt	tggaaattcc	aaagagaagt	ggtgagatct	ttactagtca	cagtgaagat	420
gggagaaaat	gacataacct	cagcagatgt	gggctgaaaa	tatcctcttc	tctgccaat	480
caggaatgct	acctgtttt	gggaataaac	tttagagaaa	ggaagggcca	aaactacgac	540
ttggctttct	gaaacggaag	cataaatgtt	cttttccctc	atttgtctgg	atctgagaac	600
ctgcatattg	tattagctag	tgggaagcagt	atgtatggtt	gaagtgcatt	gctgcag	657

<210> 129

<211> 1220

<212> DNA

<213> Homo sapien

<400> 129

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aacgtgcccc	gcatgtagat	tctggactaa	cagacaacat	acattcaccg	ctggtcaccc	120
agatcctcat	tcaaaccac	tgctggcaca	tccttttcc	tactttgccc	tgtgctacca	180
gccacggaag	gagcctctct	tgttttttct	ataaaatggg	taggcaggag	aaaagcaggt	240
gccctaagat	tgctctaagg	cccagcatgt	ggttacagtt	ctctgacttg	cagaacctgc	300
caggtgtatg	gctacaagtt	atcctcgtgc	tgatctgtct	cattactaag	ttaatggaga	360
agacagaaaag	gtaaaaatca	cgtgtagcaa	gaacaactct	tatttcacaa	actcaggtat	420
gaaacgaaac	gcctgtcctt	catggaactg	cttttagctc	ctgtcttttc	aaaatggcag	480
agggagtcc	tacacacact	ttttccctgg	aggccaaggt	ctaggggtag	aaaggggagg	540
ggtggggcta	ccaggtagca	ggtgacaacc	caaggtcaga	ggagtggccc	tcagtgtcat	600
ctgtccacag	tgatacctgc	caagatgacc	actgaccac	atctggtctt	agtcattggt	660
ctcctcagat	ttctggggcc	acctgcaagc	cccatccat	tcctacagat	ctctcagcca	720

cctgtaagtc	ctttgtgaag	atgtgggtga	cacaggggga	caggaaaacc	catttctcaa	780
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ctggtcaggg	agagaagggc	agaccattc	tcaaagacca	ccatgtccaa	ggtctgacag	960
ctccccactg	gctgccccca	caggggcttt	aggctgggtc	gggtcatggg	gaagcgtccc	1020
tcttatcgct	ggctctgtgt	ctcctggatt	tggtatctat	gttggtagca	ctcctggcct	1080
tttatctaaa	ggacttttgg	ttttgtaaat	cacaagccaa	taatagactt	ttttctcccc	1140
ctctgttttt	tgctgtgtca	tctctgcctt	gagactgcct	tgagacagtg	cttgccttga	1200
gagagtgagc	caattaacag					1220

<210> 130

<211> 1274

<212> DNA

<213> Homo sapien

<400> 130

ccatatgagt	ttgccatctc	catggatgcc	atttcaatgc	cttcagggtg	atcattctct	60
ccccaaagac	tgccccacgg	gtcatcactc	ctgtgacgaa	atgagggtctg	gattgaagat	120
gttctgctga	gcacccccct	ggtcatcttt	ggggctctcag	aagagccata	atcatgacca	180
ttctcagcat	ctgaataatc	aggttctctc	caagtgcctg	gcaagtctctg	attgtcctca	240
gcactgggat	agtctggctc	cccaaaaaag	ggtaggagat	taggttgaat	gtcagcgctc	300
ggataatcag	gctttcccag	agagtctgcg	tatggattga	ttctaaaact	tgtatgttcc	360
agattctttc	tggatcctgg	atggttcaaa	ttggctctgg	gtccaggatg	atcagagttg	420
ctctgagctc	cagggtagtc	cggttctaa	gagccaaaat	gatctggatg	tgttctggag	480
cctgcatagt	ttccactgct	gctggagcct	gcaaaaatcag	gatttcgttg	agatccaggg	540
tagtctgggt	gtctggatga	tgctcggtgg	taggyatgac	tctgaaattc	actataatct	600
ggctctggta	gagaggtagg	atgggtctgg	cttgttctag	aggctgcaga	gtatgcattg	660
cttctggtgc	cagaatagtc	tggattactc	agagatctag	gataatttgg	ttctgccaga	720
gacccaggat	agctctggac	tgtctggag	gctacagagt	atggattgct	cctgggtgccg	780
gggtaatctg	gattgttcag	aggacctgga	acatctggat	aaccttgagt	tttcaaatac	840
ccctgcgtac	ggttctgaga	ccctgaatag	tcagggtaat	ctgggtcttc	ctcagaccag	900
ttattcctgt	agtaggcaga	catgttggtg	tggactcttc	accttgaggt	ggtaaaactgt	960
cccagcattt	gcaattactc	agggatcttt	tttttttcac	ttttttgccc	ttattgttct	1020
tgctttgtcc	caagtagatg	caaagtgtgt	gcaaaccaac	ttgatcttaa	gatgttggtg	1080
agaacactgg	agtcacgtgt	ccatgggtcc	ttcaggctgg	cttttgatgg	gagctgggat	1140
gcagatgatt	tacggagggt	tataatctgt	gatgctggtc	tgaagtctga	atattccaag	1200
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ggccctcggg	tcga					1274

<210> 131

<211> 554

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(554)

<223> n = A,T,C or G

<400> 131

ctgtaattct	gccttttcta	ccttcattcc	atccttctct	tgcccagata	aagkccagca	60
gaaattcctc	ctttctacct	ctctgggact	ctgagacagg	aaatcttcaa	ggaggagttt	120
ttccctcccc	actattctta	ttctcaacct	ccagaggaac	caaggctgct	gtaccacact	180
caggacaga	actccacact	atagtgggaa	agcttcaggg	acctctcctt	ttagtgtctca	240
gggctcacct	atgctactgg	tccttttggc	aaaaaaggaa	aatgatagag	ccagggttgc	300

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ccctgatgta gcagccttac tgtggagggg ccaaagctgg tgttcagagc tcacccaagg 360
agggaggtga taaggtgtca tgcgttctgc tgaacccact ggntgggtatg aacatgaggc 420
ttggggtgag ggaaccaag taggggttgg agaaggagca gcaccttctg macacctggc 480
taccatagc tagcttctg cctcaaaaaa ctcagccttc aagggatcca gccacacac 540
gccacaggca gcag 554

```

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<210> 132
<211> 787
<212> DNA
<213> Homo sapien

```

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<400> 132
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gaggctggaa tccttcagcc ccagagccca gggaccactc cagtagatgc agagaggggc 120
ctgcccagg gtcagggcag tgggtatcac tgggtgacatc aagaatatca gggctgggga 180
ggcatcttg tttcctggg cctcctcaa agttgctgac actttgggga cgggaagggg 240
tagaagtagg gctgctcctt ttggagctgg aggggaataga cctggagaca gaggtaggc 300
agtcgggctg tccaggttct aagcatcaca gcttctgcac tgggctctga ggagattctc 360
agccagagga tcccagcctc ctctcctc aaatgtcagt ccaagcaa atccaaagcaa 420
cgcatcgatt ttgtggaagt caattagaga tgtggggagc tatcggagac aagcactatt 480
gtacctttt accctcacac ttgtcacaag cagggactgt ctctcccca cttgcttg 540
cacgcctgcc atggcttgag ctggggtgag gagggtgctt tatcttctt gggagatcct 600
gactggttg gcacttgcta agggcaggaa gtctggagg ctgcaggaat ggtgccgttg 660
ataaacaggt ggacttataa tcatcatgca ctgcaattgt agaacatagt ctctgcctt 720
ttctcatttg tataattgtc tgggtcaata ttctcccaat attgggaggg gctctgcagc 780
cctccag 787

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<210> 133
<211> 219
<212> DNA
<213> Homo sapien

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```

<220>
<221> misc_feature
<222> (1)...(219)
<223> n = A,T,C or G

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<400> 133
tactgctcta agttttgtna aatttttcat attttaattt caagcttatt ttggagagat 60
aggaaggtca tttccatgta tgcataataa tcctgcaaag tacaggtagt ttgtctaaga 120
aacattggaa gcagggttaa tgttttgtaa actttgaaat atatggtcta atgtttaagc 180
agaattggaa nagactaata tcggttaaca aataacaac 219

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```

<210> 134
<211> 234
<212> DNA
<213> Homo sapien

```

```

<400> 134
gattttaaaa acatcatgac tttgaactga aaaacataca cgtttagcac acaaattattg 60
taatatgaat gaactccaac tccatttgaa aacatgtgaa tcaaagtaca gttttagaag 120
ttagtaattc acatttaagc aagtttagcg cttgctgaat acagcctttg taaaaaagag 180
acttagtgca tattttaatg gtacattgtg gttttgtacc atttggttga gttg 234

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<210> 135

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<211> 414
 <212> DNA
 <213> Homo sapien

<400> 135
 ctccagcctg gctatatccg gtcccgctat aacctgggca tcagctgcat caacctcggg 60
 gctcaccggg aggctgtgga gcactttctg gagggcctga acatgcagag gaaaagccgg 120
 ggccccggg gtgaaggagg tgccatgtcg gagaacatct ggagcaccct gcgtttggca 180
 ttgtctatgt taggccagag cgatgcctat ggggcagccg acgcgcggga tctgtccacc 240
 ctcctaacta tgtttggcct gcccagtgga cagtgggacg ggctgccctg tgagtgtcca 300
 cctggggatt aaatatgtct tcaacaaggg aggcctggct tctacaatgg tttaggtaaa 360
 ggggcctttg aagtagttct ggccaggctt gcaatacaca caacacaaga gccca 414

<210> 136
 <211> 461
 <212> DNA
 <213> Homo sapien

<400> 136
 gaagtgatta ataggtttat ttgcatatac acagagaaga gtcagcattg ttgggtgaga 60
 agaggcaggc tgtgaggagg taaggcttca gcagagggaag gcaccttgac agacaacacg 120
 agactcctat taaatcagca cagttgcaaa cttcacctgc ctcaagccaa cagctcattg 180
 aactcatatg tcgattgaga atcatttaca aaaccaggag agaaacaatg ggaagagcaa 240
 cggctctctca tccctggacc tgacactcaa aacattatgt acaggatgca ggaacaaaat 300
 ctgtctgate agtgccctct cctgctggga aaaacaccca tcacggaaga atttggggat 360
 taaatatgtc ttcaacaagg gaggcctggc ttctacaatg gtttaggtaa aggggccttt 420
 gaagtagttc tggccaggct tgcaatacac acaacacaag a 461

<210> 137
 <211> 269
 <212> DNA
 <213> Homo sapien

<400> 137
 atagcaaatg gacacaaatt acaaatgtgt gtgcgtggga cgaagacatc tttgaaggtc 60
 atgagtttgt tagtttaaca tcatatatct gtaatagtga aacctgtact caaaatataa 120
 gcagcttgaa actggcttta ccaatcttga aatttgacca caagtgtctt atatatgcag 180
 atctaataa aaatccagaa cttggactcc atcggttaaaa ttatttatgt gtaacattca 240
 aatgtgtgca ttaaatatgc ttccacagt 269

<210> 138
 <211> 452
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(452)
 <223> n = A,T,C or G

<400> 138
 ctccatggga ggcaaaatat agagaattta tgggtgccca ctcttatgta atcactggac 60
 taatcttccc tggttaactat gcaacatttg gacagaaagg cacacaaaaa agtttaataa 120
 tttcatgtgc caatctggaa aaaaataatt taaatcaaca gaacagacag tacatctaca 180
 caaatgagga aagcagaaaa gatacctcac attcatttat cttaggtttc aaagtggctt 240

caatgctaaa gtaaatgtat taacatttgg aaaatacaag acaatttttt tgtttgtttt	300
caattttttt agctctatac aatgattaca acataagaca aaaaaaaaaa aaaaacacaa	360
aaaacaaaac aaaaaaggag ttcaggactt gttatcagtg tccaagtggc taanaactgg	420
ttcccataac aagcattgaa agttaaggcc cc	452

<210> 139
<211> 474
<212> DNA
<213> Homo sapien

<400> 139	
tgtgcctcat tgaggttaca attgaaacag atgtgagcac ctgagagact ttccctgatt	60
atattcctcc acaaaccact gtaccatatt accttatttt atcttcttga aattcttatt	120
cattggcttg tttgttgtct ctttgcatta gatatatgta agtccttgg cataaatttg	180
acattggtag gggactgaca ttctaacctg gcccaggccc taggagagag ataactccac	240
aaagcagcac atactatctt aggttagcag ggagctaaact caccatgtag cagatgaaaa	300
aaaccaaacc cagcactgtg cataaatacc acttgccaag aagtcaggctc ctcggcaacc	360
gagaatcaac ctcaacacaa acgcagggtg ctgggctctg ttccccctta gccaccacct	420
cagcctctcc cctccccctgc cccaagtgcc caagagcttg gctctctgtg cttt	474

<210> 140
<211> 487
<212> DNA
<213> Homo sapien

<400> 140	
cttccctgcc tcgtgttctt gagaaacgga ttaatagccc tttatcccc tgcaccctcc	60
tgcaggggat ggcactttga gccctctgga gccctcccc tgcctgagcct tactctctc	120
agactttctg aatgtacagt gccgttggtt gggatttggg gactggaagg gaccaaggac	180
actgacccca agctgtcctg cctagcgtcc agcgtcttct aggagggtgg ggtctgcctg	240
tcctggtgtg gttggtttgg ccctgtttgc tgtgactacc cccccccctc cccgaaccga	300
gggacggctg cctttgtctc tgccctcagat gccacctgcc ccgcccctgc tccccatcag	360
cagcatccag actttcagga agggcagggc cagccagtc agaacccat ccctcagcag	420
ggactgataa gccatctctc ggagggtccc ctaataccca agtggagtct ggttcacacc	480
ctggggg	487

<210> 141
<211> 248
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(248)
<223> n = A,T,C or G

<400> 141	
ttaaagatgg ggaaatgagg cctgnaaata gaaaagattt gcctagagtc acacacactg	60
tcagggtcagg tagagtcaaa atcaggcacc ccgactcaca gactgcttca cattgccatc	120
agagattgtc ctgcaacaat attatgttta gttctactgc agaataataa ctggatctta	180
ccccctttgc ctgatctggc cacaaacttg tttttcaggt ctttccatta ggctctcttc	240
agctaatt	248

<210> 142
<211> 173

<212> DNA

<213> Homo sapien

<400> 142

tactaagatt	gtccaagcct	ccctctttaa	actttctttc	ccttttagagg	aatcattact	60
tcgtattaaa	agtttctact	tccttgtaga	atatctacat	ccaatgggcc	atggcacaaa	120
atttaagtct	agaaaagaatc	ttaaaggctc	atcttatagt	aaccagaggc	agg	173

<210> 143

<211> 511

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(511)

<223> n = A,T,C or G

<400> 143

cctcgtcaga	ggggtggttc	ctggtnacct	gtactccacg	gacctcggtg	aagcaaaagc	60
ttcagggcag	aggggaatgag	gcaaccagct	ggcagccccg	ctgggccccg	tggctcctgc	120
tctcctattg	gacgtagagg	caggggagag	acttctctat	acaaatattc	tcatcacaga	180
agggatgata	cttgctgctc	tgccgtaggg	tttttgatgc	tgagctatgc	tgcacatgac	240
gttaacctaa	agaacttgga	ctgagctttt	aaaaaaggac	agcaaacaat	tttataatcc	300
ttaaagtgtg	atagacggtt	acactagtgc	aggggtattgg	ggaggctctt	tgggtgtgga	360
ggctgtcact	tgtattttatt	gtgactctaa	atcttttgata	gtaaaacaaa	tgtaaaaaga	420
aatgtttgcc	accagatggg	aatagaagtt	ccaataagca	ggctggaatg	ggtggctata	480
cgttgatatca	cgaggaagtt	ttagactctg	a			511

<210> 144

<211> 190

<212> DNA

<213> Homo sapien

<400> 144

cattcttctg	tcacatgcca	attcagttgt	caatccatt	gtctatgctt	accggaaccg	60
agacttccgc	tacacttttc	acaaaattat	ctccaggtat	cttctctgcc	aagcagatgt	120
caagagtggg	aatggtcagg	ctggggtaca	gcctgctctc	ggtgtgggcc	tatgatctag	180
gctctcgcc						190

<210> 145

<211> 169

<212> DNA

<213> Homo sapien

<400> 145

gatgtggtta	tctcctcaga	tggccagttt	gcctctcag	gctcctggga	tggaaccctg	60
cgcctctggg	atctcacaac	gggcaccacc	acgaggcgat	ttgtgggcca	taccaaggat	120
gtgctgagtg	tggccttctc	ctctgacaac	cggcagattg	tctctggat		169

<210> 146

<211> 511

<212> DNA

<213> Homo sapien

<400> 146
 atctagagaa gatttgggaa acacatgata gctatgggta aataacttaac agggcaatca 60
 caggggaagat gactagattt cctaacatcc atgagtgaag tttatagaag tatactctct 120
 gacttgatat aaaggaagat tttaaaaaac atgactgttc aggagtgttc aagtagggtc 180
 agatgaccag tgattgggaa tacttcgtaa gcaggagcaa gtaagatctg agccactgtt 240
 ctatcggtag ggtgtctgtg gtattccttg gtcaaagaag tactctaagc aacttcagtc 300
 tcacgaatta ctatcacct cgtgggcata catgatgggt accctaaga ggaagtcca 360
 gaaggcagta atattggatc ctggaatagt cagacaggag ccttcatgca gatacccttt 420
 tcagttctcc atacacccat tcacaagtgg tcacaaaaac acccagtacc tttacttggc 480
 tttaccact taacaatatg ctcaatatga g 511

<210> 147

<211> 421

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(421)

<223> n = A,T,C or G

<400> 147
 gaccagttga gttcttcttg gctattgtat aatccacagc cacactgtga aagcaaatct 60
 ggccagttag caacacaggg agaatctgcc tgaactgacc aaagggtgtcc atacttcagtg 120
 tcagttagaa tttcacctcc atcatgttct aaagagccaa caacagattc tagggcactg 180
 caaaatgctt cagcaattaa ttgaagttct gtttgagtac attcatcatc tttgagaatg 240
 ctttctgggt cgttgtgagt cttgtgtctg atatatgcag ccaaagagt ttcagtacag 300
 ccacctcca acaaagccca tggttccttg agtggttaact gcaggacatg cagtgccgtc 360
 tgacacgtga gttcagctc atcccangca gtgtcatttc tgttcagag aagccaagct 420
 g 421

<210> 148

<211> 237

<212> DNA

<213> Homo sapien

<400> 148
 acacaccact gttggccttc catctgggtt aagtcaactg tgagttagaaa ccgaagataa 60
 cagttttgta ttcataatgg ctttttcata ctccaagtac ttttgagcac agagcctctt 120
 gcttctgacc tggcacttgg aacacagata tatatatctt ttgttctgtc cctgggaaac 180
 tgatatttgt gtaagacaac caccagatat tttctctaata aaaatcttct aaaatta 237

<210> 149

<211> 168

<212> DNA

<213> Homo sapien

<400> 149
 agagaaagtt aaagtgaat aatgtttgaa gacaataagt ggtgggtgat cttgtttcta 60
 ataagataaa cttttttgtc tttgctttat cttattaggg agttgtatgt cagtgtataa 120
 aacatactgt gtggtataac aggccttaata aattctttaa aaggagag 168

<210> 150

<211> 68

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(68)

<223> n = A,T,C or G

<400> 150

ggtggggttt ggcagagatg antttaagtg ctgtggccag aagcgggggg ggggtttggt	60
ggaaattt	68

<210> 151

<211> 421

<212> DNA

<213> Homo sapien

<400> 151

aggtgacacg tattcgggat gaaagtataa tagtcattcc ttcaaccctt gcatttatgg	60
actctggaaa tcgaagatcc acagtgagta aagatgttcg tccaaagaca aaaaatagaa	120
acagctcaac aaagcgagag acaaaaaaac aaaatggcac tgtggctctg cctttgaagt	180
ctgggctcca gcagagggt gatcttccca caggagacga gacggcctat gacactctcc	240
agaactgttg tcagtgccga attttacttc ccttgcccat tctaaatgag caccaggaga	300
agtgccagag gttagctcac caaaagaaac tccagtgggg ctggtgagat ggctcagcgg	360
gtaagagcac ccgactgctc ttccgaaggt ccggagttca aatcccagca accacatggt	420
g	421

<210> 152

<211> 507

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(507)

<223> n = A,T,C or G

<400> 152

gaattcggca cnagctcgtg ccgccagggt nggtcctttt tttgctccgc ctgccanga	60
cttcctacag ctatcgccag tcgtcggcca cgtcttcctt cngaggcctg ggcggcggct	120
ccgtgcgttn tgggccgggg gtcgcctttc nctcnccag cattcacggg ggctccggcg	180
gccgcggcgt atccgtgtcc tccgccgct ntgtgtcctc gtccctctcn ggggcctacg	240
gctngctgct acngcggctt cctgaccgct tccnacgggc tgctggcngg caacgagaag	300
ctaaccatgc agaacctnaa cnaccgcctg gcctcctacc tgnacaaggt gcgcncctg	360
taggcggcca acggcnagct agaggtgaag atccnctact gggtagcaga agcaggggcc	420
tgggcctgc ccgactacag ccactnctnc acnaccatgc agtacctgcn ggganaagat	480
tntngggngc caccatngag aactgca	507

<210> 153

<211> 513

<212> DNA

<213> Homo sapien

<400> 153

gaattcggca cgaggtggct cagatgtcca ctactgggag tatggctgaa ttgggaattt	60
tatttgtaaa aagcccatgg tgctgggaca tgaagcttcg ggaacagtcg aaaaagtggg	120

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atcatcggtta aagcacctaa aaccagggtga tcgtgttgcc atcgagcctg gtgctccccg      180
agaaaatgat gaattctgca agatggggccg atacaatctg tcaccttcca tcttcttctg      240
tgccgcgccc cccgatgacg ggaacctctg ccggttctat aagcacaatg cagccttttg      300
ttacaagctt cctgacaatg tcacctttga ggaaggcgcc ctgatcgagc cactttctgt      360
ggggatccat gcctgcagga gaggcggagt taccctggga cacaaggctc ttgtgtgtgg      420
agctgggcca atcgggatgg tcactttgct cgtggccaaa gcaatgggag cagctcaagt      480
agtggtgact gatctgtctg ctacccgatt gtc                                     513

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<210> 154

<211> 507

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(507)

<223> n = A,T,C or G

<400> 154

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ggcacgagct cgtgccgaat tcggcncgag cagacacaat ggtaagaatg gtgcctgtcc      60
tgctgtctct gctgctgctt ctgggtcctg ctgtcccca ggagaacca gatggctggt      120
actctctgac ctatatctac actgggctgt ccaagcatgt tgaagacgtc cccgcgtttc      180
agggccttgg ctactcaat gacctccagt tctttagata caacagtaaa gacaggaagt      240
ctcagcccat gggactctgg agacagggtg aaggaatgga ggattggaag caggacagcc      300
aacttcagaa ggccaggagg gacatcttta tggagaccct gaaagacatc gtggagtatt      360
acaacgacag taacgggtct cacgtattgc agggaaggtt tggttgtgag atcgagaata      420
acagaagcag cggagcattc tggaaatatt actatgatgg aaaggactac attgaattca      480
acaaagaaat cccagcctgg gtcccct                                     507

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<210> 155

<211> 507

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(507)

<223> n = A,T,C or G

<400> 155

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ggcacgagga gacctaaagg ctgagtntcg ggaacaggag aaagctctgt tggccctcca      60
gcagcagtgt gctgagcagg cacaggagca tgaggtggag accagggccc tgcaggacag      120
ctggctgcag gcccaggcag tgcctcaagg acgggaccag gagctggaag ctctgcgggc      180
agaaagtcag tcctcccggc atcaggagga ggctgcccgg gcccgggctg aggctctgca      240
ggagggcctt ggcaaggctc atgctgccct gcaggggaaa gagcagcatc tcctcgagca      300
ggcagaattg agccgcagtc tggaggccag cactgcaacc ctgcaagcct ccctggatgc      360
ctgccaggca cacagtcggc agctggagga ggctctgagg atacaagaag gtgagatcca      420
ggaccaggat ctccgatacc aggaggatgt gcagcagctg cagcaggcac ttgccagag      480
ggatgaagag ctgagacatc agcagga                                     507

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<210> 156

<211> 509

<212> DNA

<213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(509)
 <223> n = A,T,C or G

<400> 156
 ggcacgagga cagagagaac cctgtngaaa gagcgttacc aggaggtcct ggacaaacag 60
 aggcaagtgg agaatcagct ccaagtgcaa ttaaagcagc ttcagcaaag gagagaagag 120
 gaaatgaaga atcaccagga gatattaaag gctattcagg atgtgacaat aaagcgggaa 180
 gaaacaaaga agaagataga gaaagagaag aaggagtttt tgcagaagga gcaggatctg 240
 aaagctgaaa ttgagaagct ttgtgagaag ggcagaagag aggtgtggga aatggaactg 300
 gatagactca agaatcagga tggcgaaata aataggaaca ttatggaaga gactgaacgg 360
 gcctggaagg cagagatcct atcactagag agccggaaaag agttactggt actgaaacta 420
 gaagaagcag aaaaagaggc agaattgcac cttacttacc tcaagtcaac tcccccaaca 480
 ctggagacag ttcgttccaa acaggagtg 509

<210> 157
 <211> 507
 <212> DNA
 <213> Homo sapien

<400> 157
 ggcacgaggg cagccctcct accggcgcac gtggtgccgc cgctgctgcc tcccgtcgc 60
 cctgaaccca gtgcctgcag ccatggctcc cggccagctc gccttattta gtgtctctga 120
 caaaaccggc cttgtggaat ttgcaagaaa cctgaccgct cttggtttga atctgtctgc 180
 ttccggaggg actgcaaaaag ctctcagggg tgctggctctg gcagtcagag atgtctctga 240
 gttgacggga tttcctgaaa tgttgggggg acgtgtgaaa actttgcac ctgcagtcca 300
 tgctggaatc ctagctcgta atattccaga agataatgct gacatggcca gacttgattt 360
 caatcttata agagttgttg cctgcaatct ctatcccttt gtaaagacag tggcttctcc 420
 aggtgtaagt gttgaggagg ctgtggagca aattgacatt ggtggagtaa ccttactgag 480
 agctgcagcc aaaaaccacg ctcgagt 507

<210> 158
 <211> 507
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(507)
 <223> n = A,T,C or G

<400> 158
 ggcacgagtc gagctgtgcc tattcngntc aatccaagag tgagtaatgt gaagtctgtc 60
 tacaaaaccc acattgatgt cattcattat cggaaaacgg atgcaaaacg tctgcatggc 120
 cttgatgaag aagcagaaca gaaacttttt tcagagaaac gtgtggaatt gcttaaggaa 180
 ctttccagga aaccagacat ttatgagagg cttgcttcag ccttggctcc aagcatttat 240
 gaacatgaag atataaagaa gggaattttg cttcagctct ttggcgggac aagggaaggat 300
 tttagtcaca ctggaagggg caaatttcgg gctgagatca acatcttgct gtgtggcgac 360
 cctggtacca gcaagtccca gctgctgcag tacgtgtaca acctcgctcc cagggggccag 420
 tacacgtntg ggaagggctc cagtgcannnt ggcctnactg cntacgtaat gaaagaccct 480
 gagacaaggn anctggnnct gnnacag 507

<210> 159
 <211> 508

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(508)

<223> n = A,T,C or G

<400> 159

ggcacnanaa	accaggatta	tggtnnngat	ccaaagattg	ctaatagcaat	aatgaaggca	60
gcagatgagg	tagctgaagg	taaattaaat	gatcattttc	ctctcgtggg	atggcagact	120
ggatcaggaa	ctcagacaaa	tatgaatgta	aatgaagtca	ttagcaatag	agcaattgaa	180
atgttaggag	gtgaacttgg	cagcaagata	cctgtgcata	ccaacgatca	tgtaataaaa	240
agccagagct	caaatgatac	ttttcccaca	gcaatgcaca	ttgctgctgc	aatagaagtt	300
catgaagtac	tgttaccagg	actacagaag	ttacatgatg	ctcttgatgc	aaaatccaaa	360
gagtttgac	agatcatcaa	gattggacgt	actcatactc	aggatgctgt	tccacttact	420
cttgggcagg	aatttagtgg	ttatgttcaa	caagtaaaat	atgcaatgac	aagaataaaa	480
gctgccatgc	caagaatcta	tgagctcg				508

<210> 160

<211> 508

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(508)

<223> n = A,T,C or G

<400> 160

ggcacgagct	tgagcgaag	tcactctnaag	gaattagagg	acacacttca	ggtaggcac	60
atacaagagt	ttgagaaggt	tatgacagac	cacagagttt	ctttggagga	attaaaaaag	120
gaaaaccaac	aaataattaa	tcaaatacaa	gaatctcatg	ctgaaattat	ccaggaaaaa	180
gaaaaacagt	tacaggaatt	aaaactcaag	gtttctgatt	tgtcagacac	gagatgcaag	240
ttagagggtt	aacttgctgt	gaaggaagca	gaaactgatg	aaataaaaat	tttgcctggaa	300
gaaagcagag	cccagcagaa	ggagaccttg	aaatctcttc	ttgaacaaga	gacagaaaat	360
ttgagaacag	aaattagtaa	actcaaccaa	aagattcagg	ataataatga	aaattatcag	420
gtgggcttag	cagagctaag	aactttaatg	acaattgaaa	aagatcagtg	tatttccgag	480
ttaattagta	gacatgaaga	agaatcta				508

<210> 161

<211> 507

<212> DNA

<213> Homo sapien

<400> 161

ggcacgagcg	ctaccggcgc	ctcctctgcg	gccactgagc	cggagccggc	ctgagcagcg	60
ctctcggttg	cagtaccac	tggaaggact	taggcgctcg	cgtggacacc	gcaagcccct	120
cagtagcctc	ggcccaagag	gcctgctttc	cactcgctag	ccccgccggg	ggcccggtgc	180
ctgtctcggt	ggccggaccc	gggcccagagc	ccgagcagta	gccggcgcca	tgtcgggtgg	240
gggcatagac	ctgggcttcc	agagctgcta	cgctcgctgtg	gcccgcgccg	gcggcatcga	300
gactatcgct	aatgagtata	gcgaccgctg	cacgcgggct	tgcatttctt	ttggtcctaa	360
gaatcgttca	attggagcag	cagctaaaag	ccaggttaatt	tctaatagca	agaacacagt	420
ccaaggattt	aaaagattcc	atggccgagc	attctctgat	ccatttgtgg	aggcagaaaa	480
atctaaccctt	gcataatgata	ttgtgca				507

<210> 162
 <211> 507
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(507)
 <223> n = A,T,C or G

<400> 162
 ggcacgagca gctgtgcacc gacatgntct cagtgtcctg agtaagacca aagaagctgg 60
 caagatcctc tctaataatc ccagcaaggg actggccctg ggaattgccca aagcctggga 120
 gctctacggc tcacccaatg ctctggtgct actgattgct caagagaagg aaagaaacat 180
 atttgaccag cgtgccatag agaatgagct actggccagg aacatccatg tgatccgacg 240
 aacatttgaa gatattctctg aaaaggggtc tctggaccaa gaccgaaggc tgtttgtgga 300
 tggccaggaa attgctgtgg tttacttccg ggatggctac atgcctcgtc agtacagtct 360
 acagaattgg gaagcacgtc tactgctgga gaggtcacat gctgccaaagt gccagacat 420
 tgccaccag ctggctggga ctaagaaggc gcagcaggag ctaagcaggc cgggcatgct 480
 ggagatgttg ctcctggcc agcctga 507

<210> 163
 <211> 460
 <212> DNA
 <213> Homo sapien

<400> 163
 ggcacgagaa ataactttat ttcattgtgg gtcgcgggtc ttgtttgtgg atcgctgtga 60
 tcgtcacttg acaatgcaga tcttcgtgaa gactctgact ggtaagacca tcaccctcga 120
 gggtgagccc agtgacacca tcgagaatgt caaggcaaaag atccaagata aggaaggcat 180
 cctcctgac cagcagaggc tgatctttgc tggaaaacag ctggaagatg ggcgaccct 240
 gtctgactac aacatccaga aagagtcac cctgcacctg gtgctccgtc tcagaggtgg 300
 gatgcaaadc ttcgtgaaga cactcactgg caagaccatc acccttgagg tggagcccag 360
 tgacaccatc gagaacgtca aagcaaagat ccaggacaag gaaggcatc ctcctgacca 420
 gcagaggttg atctttgccg gaaagcagct ggaagatggg 460

<210> 164
 <211> 462
 <212> DNA
 <213> Homo sapien

<400> 164
 ggcacgagcc ggatctcatt gccacgcgcc cccgacgacc gcccgcgctg cattcccgat 60
 tccttttggg tccaagtcca atatggcaac tctaaaggat cagctgattt ataatcttct 120
 aaaggaagaa cagacccccc agaataagat tacagttgtt ggggttggtg ctgttggcat 180
 ggctgtgcc atcagtatct taatgaagga cttggcagat gaacttgctc ttgttgatgt 240
 catcgaagac aaattgaagg gagagatgat ggatctccaa catggcagcc ttttccttag 300
 aacaccaaag attgtctctg gcaaagacta taatgtaact gcaaactcca agctggcat 360
 tatcacggct ggggcacgtc agcaagaggg agaaagccgt cttaatttgg tccagcgtaa 420
 cgtgaacatc ttttaattca tcattcctaa tgttgtaaaa ta 462

<210> 165
 <211> 462
 <212> DNA

<213> Homo sapien

<400> 165

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ggcacgagga agccatgagc agcaaagtct ctcgcgacac cctgtacgag gcggtgcggg      60
aagtcctgca cggaaccag cgcaagcgcc gcaagttcct ggagacggtg gagttgcaga      120
tcagcttgaa gaactatgat cccagaagg acaagcgctt ctcgggcacc gtcaggctta      180
agtccactcc ccgccctaag ttctctgtgt gtgtcctggg ggaccagcag cactgtgacg      240
aggctaaggc cgtggatatc cccacatgg acatcgaggc gctgaaaaaa ctcaacaaga      300
ataaaaaact ggtcaagaag ctggccaaga agtatgatgc gtttttggcc tcagagtctc      360
tgatcaagca gattccacga atcctcggcc cagggtttaa taaggcagga aagttccctt      420
ccctgctcac acacaacgaa aacatggtgg ccaaagtggg tg                      462
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<210> 166

<211> 459

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(459)

<223> n = A,T,C or G

<400> 166

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ggcacgagag ggacctgtnt gaatggntcc actagggttn anntgntctt tacttttaac      60
cantnaaata gacctgcccg tgaanangcg ggcntgacac annaanacga gaagacccta      120
tgagagcttta atttattaat gcanacagna cctaacaac ccacangtcc taaactacca      180
agcctgcatt aaaaatttcg gntggggcna cctcnnagca naacccaacc tccgagcaac      240
tcatgctaag acttcaccag tcaaagctga actactatac tcaattgatc caataacttg      300
accaacagan caagntaccc tagggataac ancacaatcc tattctagac cccttatnac      360
caatangntt tacacctcna tngnggaacc aggacatccg atggggcagn cgttattaaa      420
gttngttgnt aacnataaag tctacgtgat ctgagttag                      459
```

<210> 167

<211> 464

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(464)

<223> n = A,T,C or G

<400> 167

```
gaattgggac caacganaan cntgcggntc ttnttttgcn tccanngccc agctnattgc      60
tcagacacac atggggaagg tnaaggtegg gagtcaacng atttggtngt attgnagcgt      120
ttggtcacca gngctgcttt taactctggn aaagtggata ttgttgatcat naatgacccc      180
tncattgacc tnaactacat ggtttacatg ttccaatatg attccacca tggcaaattc      240
catngcaccg tnaaggctga gaacgggaag cttgtnatca atggaaatcc catcaccatc      300
tttcangaac ganatccntn caaaaatcaa anttgggggc gatgcttggc cnettgaagt      360
accgttcaan ggggaannnc ccactttggc cgntntttnc aancecacc caatttgggn      420
aaaaaaaaag ggggnntttg gggggggcct tttanntttt tttt                      464
```

<210> 168

<211> 462

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(462)

<223> n = A,T,C or G

<400> 168

ggcacgaggn	nnaacctnccg	gggctggggc	agcacgcctt	gngcaancct	gcactgcact	60
gaagaccg	tgccggaagc	cgnggcngc	nacatgcagn	aactgaacca	gctgggcgcg	120
cancagttct	cagacctgac	agaggtgctt	ttacacttcc	taactgatcc	anantangtg	180
gaaatattnt	tngttnatnt	catntgaatn	atccancncc	aatcatanca	nntttnattn	240
cctcataanc	nttgagaana	gcnnccctnt	gnttncanan	ggtgctntga	anangagtct	300
cacangcaan	caggtccaag	cggatttntt	aactntgggt	cttantgang	agaaagncac	360
ttacttttct	gaaancngga	agcagaatgc	tcccaccctt	gctcgatggg	ccatacgtca	420
agactctgat	gattaaccag	ctttanatata	ggacnggaaa	tt		462

<210> 169

<211> 460

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(460)

<223> n = A,T,C or G

<400> 169

ggcacgaggg	acagcagacn	agacagtcac	agcagccttg	acaaaacgtt	cctggaactc	60
aagntcttnt	ncncaaagga	ggacagagca	nacagcagag	accatggant	ctncctcggc	120
ccctccccac	agatgggtgca	tcccctggca	naggctcctg	ctcacagcct	cacttctaac	180
cttctggaac	ccgcccacca	ctgccaagct	cactattgaa	tccacgccgt	tcaatgnntc	240
ntaggggaag	gagnggcttt	ctactnttnc	acaatctgan	ccccttcttn	tttggttact	300
ancatggctc	tncatgtnaa	aatactggna	tggntaacct	gtcaaattta	taggnantnt	360
gctaattggg	aaactnccnn	tngtctaccc	caggggnccc	agattcctnn	gttcncataa	420
cnattaattt	aacccctaata	gncaanccct	tngttaaaga			460

<210> 170

<211> 508

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(508)

<223> n = A,T,C or G

<400> 170

ggcacgaggg	ggatttttag	gtggtcnggt	gtggatatcag	gaataatgtg	ggaggccaga	60
ttgaagtcca	ggccaggaac	aatggtaatt	gtgggactta	agaaagtgtg	agtacagctg	120
aatgagccgg	ggagcagaaa	gtatatgcgt	caggtatgag	gaagaaaata	gattttggaa	180
gttatgagaa	atgtagagag	tgagttgagc	atagtttgtg	attttgaggg	cctctaacag	240
tattaaagca	gcggcagcgg	ctgcacacag	acatgatggc	taggctaaaa	caggaaggtc	300
aagttgtttg	gacagaaaag	ctacaggggtg	cagtcctggc	tcttgtgtaa	gaattctgac	360
cacactaacc	atgcctagga	aggaaaggag	ttgttctttt	gtaagggtatt	gaggtttggg	420

agattaatcg gacacgatca gcagggagag cacctgtgtt tttatgagaa ttatgctgag 480
 ataggtaaca gatgaggatg aaatttgg 508

<210> 171

<211> 507

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(507)

<223> n = A,T,C or G

<400> 171

ggcacgagac cagccactag cgcagnctcg agcgatggcc tatgtccccc caccgggcta 60
 ccagcccacc tacaaccoga cgctgcctta ctaccagccc atcccgggcg ggctcaacgt 120
 gggaatgtct gtttacatcc aaggagtggc cagcgagcac atgaagcggg tcttcgtgaa 180
 ctttgtgggt gggcaggatc cgggctcaga cgtcgccttc cacttcaatc cgcggtttga 240
 cggctgggac aaggtggtct tcaacacgtt gcagggcggg aagtggggca gcgaggagag 300
 gaagaggagc atgcccttca aaaagggtgc cgcctttgag ctgggtcttca tagtccctggc 360
 tgagcactac aaggtggtgg taaatggaaa tcccttctat gagtacgggc accggcttcc 420
 cctacagatg gtcacccacc tgcaagtgga tggggatctg caacttcaat caatcaactt 480
 catcggaggc cagcccctcc ggcccca 507

<210> 172

<211> 409

<212> DNA

<213> Homo sapien

<400> 172

ggcacgagct ggagtgtctg ctgccacccc ctcgctctct gcagaaatgt ctgtcaccta 60
 cgatgactct gtgggagtgg aagtgtccag cgacagcttc tgggagggtg ggaactacaa 120
 acggactgtg aagcggattg acgatggcca ccgcctgtgt ggtgacctca tgaactgtct 180
 gcatgagcgg gcacgcacg agaaggcgta tgcacagcag ctactgagt gggccccgacg 240
 ctggaggcag ctggtagaga agggaccaca gtatgggacc gtggagaagg cctggatagc 300
 tgtcatgtct gaagcagaga gggtagtgga actgcacctg gaagtgaagg catcactgat 360
 gaatgaagac tttgagaaga tcaagaactg gcagaaggaa gcctttcac 409

<210> 173

<211> 409

<212> DNA

<213> Homo sapien

<400> 173

ggcacgaggg cagctagagg aagagtccaa ggccaagaac gcactggccc acgccctgca 60
 gtcagctcgc catgactgtg acctgctgcg ggaacagtat gaagaggagc aggaagccaa 120
 ggctgagctg cagagggcca tgtccaaggc caacagcgag gtagcccagt ggaggacgaa 180
 atatgagacg gatgccatcc agcgcacaga ggagctggaa gaggccaaga agaagctggc 240
 tcagcgtctg caggatgctg aggaacatgt agaagctgtg aattccaaat gcgcttctct 300
 tgaaaagacg aagcagcgac ttcagaatga agtggaggac ctcatgattg acgtggagag 360
 gtctaattgt gcctgcgctg cgcttgataa gaagcagagg aactttgac 409

<210> 174

<211> 407

<212> DNA

<213> Homo sapien

<400> 174

ggcacgagcc	ggggcggggc	gcggcgctcc	ggctcgaggc	attcggagct	gcgggagccg	60
ggctggcagg	agcaggatgg	cggcggcggc	ggctgcaggc	gaggcgcgcc	gggtgctggt	120
gtacggcggc	agggcgctc	tgggttctcg	atgcgtgcag	gcttttcggg	cccgcaactg	180
gtgggttgcc	agcgttgatg	tgggtggagaa	tgaagaggcc	agcgctagca	tcattgttaa	240
aatgacagac	tcgttcactg	agcaggctga	ccagggtgact	gctgagggtg	gaaagctctt	300
gggtgaagag	aaggtggatg	caattctttg	cggtgctgga	ggatgggccg	ggggcaatgc	360
caaatccaag	tctctcttta	agaactgtga	cctgatgtgg	aagcaga		407

<210> 175

<211> 407

<212> DNA

<213> Homo sapien

<400> 175

ggcacgagct	tgcccgctcg	tcgctagctc	gctcgggtgcg	cgctcgcccc	ctccatggcg	60
ctcttcgtgc	ggctgctggc	tctcgccctg	gctctggccc	tgggccccgc	cgcgaccctg	120
gcgggtcccc	ccaagtgcgc	ctaccagctg	gtgctgcagc	acagcaggct	ccggggccgc	180
cagcacggcc	ccaacgtgtg	tgctgtgcag	aagggtattg	gcactaatag	gaagtacttc	240
accaactgca	agcagtggta	ccaaaggaaa	atctgtggca	aatcaacagt	catcagctac	300
gagtgtgtgc	ctggatatga	aaaggtccct	ggggagaagg	gctgtccagc	agccctacca	360
ctctcaaacc	tttacgagac	cctgggagtc	gttggtacca	ccaccac		407

<210> 176

<211> 409

<212> DNA

<213> Homo sapien

<400> 176

ggcacgagtg	gtgccaaaac	gggaccatgc	cctcctggag	gagcagagca	agcagcagtc	60
caacgagcac	ctgcgccgcc	agttcgccag	ccaggccaat	gttgtggggc	cctggatcca	120
gaccaagatg	gaggagatcg	ggcgcatctc	cattgagatg	aacgggaccc	tggaggacca	180
gctgagccac	ctgaagcagt	atgaacgcag	catcgtggac	tacaagccca	acctggacct	240
gctggagcag	cagcaccagc	tcattccagga	ggccctcatc	ttcgacaaca	agcacaccaa	300
ctataccatg	gagcacatcc	gcgtgggctg	ggagcagctg	ctcaccacca	ttgcccgcac	360
catcaacgag	gtggagaacc	agatcctcac	ccgcgacgcc	aagggcac		409

<210> 177

<211> 408

<212> DNA

<213> Homo sapien

<400> 177

ggcacgaggt	ccaggtaact	gcaaaaacaa	tggctcagca	tgaagaactg	atgaagaaaa	60
ctgaaacaat	gaatgtagtt	atggagacca	ataaaatgct	aagagaagag	aaggagcagg	120
tttcaaaaat	ggcatcagtc	cgctcagcatt	tggagaagaa	aacacagaaa	gcagaatcac	180
agttgttgga	gtgtaaagca	tcttgggagg	aaagagagag	aatgttaaa	gatgaagttt	240
ccaaatgtgt	atgtcgctgt	gaagatctgg	agaaacaaaa	cagattactt	catgatcaga	300
tcgaaaaatt	aagtgacaag	gtcgttgcc	ctgtgaagga	aggtgtacaa	ggtccactga	360
atgtatctct	cagtgaagaa	ggaaaatctc	aagaacaaat	tttggaaa		408

<210> 178

<211> 92

<212> DNA

<213> Homo sapien

<400> 178

ggcacgagaa gaaattaaga gctaaagaca aggagaatga aaatatgggt gcaaagctga	60
acaaaaaagt taaagagcta gaagaggaga tg	92

<210> 179

<211> 411

<212> DNA

<213> Homo sapien

<400> 179

ggcacgagga gacacgccac ctataccaca gttctcagaa tgaattagct aagttggaat	60
cagaacttaa gagtctcaaa gaccagttga ctgattttaag taactcttta gaaaaatgta	120
aggaacaaaa aggaaacttg gaagggatca taaggcagca agaggctgat attcaaaatt	180
ctaagtccag ttatgaacaa ctggagactg atcttcaggc ctccagagaa ctgaccagta	240
ggctgcatga agaaataaat atgaaagagc aaaagattat aagcctgctt tctggcaagg	300
aagaggcaat ccaagtagct attgctgaac tgcgtcagca acatgataaa gaaattaaag	360
agctggaaaa cctgctgtcc caggaggaag aggagaatat tgttttagaa g	411

<210> 180

<211> 411

<212> DNA

<213> Homo sapien

<400> 180

ggcacgaggt tgttcggagc gggcgagcgg agttagcagg gctttactgc agagcgcgcc	60
gggcactcca gcgaccgtgg ggatcagcgt aggtgagctg tggccttttg cgagggtgctg	120
cagccatagc tacgtgcgtt cgctacgagg attgagcgtc tccaccatc ttctgtgctt	180
caccatctac ataatgaatc ccagtatgaa gcagaaacaa gaagaaatca aagagaatat	240
aaagactagt tctgtcccaa gaagaactct gaagatgatt cagccttctg catctggatc	300
tcttggttga agagaaaatg agctgtccgc aggcttgtcc aaaaggaaac atcggaatga	360
ccacttaaca tctacaactt ccagccctgg gggtattgtc ccagaatcta g	411

<210> 181

<211> 411

<212> DNA

<213> Homo sapien

<400> 181

ggcacgaggc gggacagggc gaagcggcct gcgccacgg agcgcgcgac actgcccgga	60
agggaccgcc acccttgccc cctcagctgc ccactcgtga tttccagcgg cctccgcgcg	120
cgcacgatgc cctcggccac cagccacagc gggagcggca gcaagtcgtc cggaccgcca	180
ccgccgtcgg gttcctccgg gagtgaggcg gccgcgggag ccggggccgc cgcgccggct	240
tctcagcacc ccgcaaccgg caccggcgct gtccagaccg aggccatgaa gcagattctc	300
ggggtgatcg acaagaaact tcggaacctg gagaagaaaa agggtaagct tgatgattac	360
caggaacgaa tgaacaaagg ggaaaggctt aatcaagatc agctggatgc c	411

<210> 182

<211> 411

<212> DNA

<213> Homo sapien

<400> 182

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ggcacgagcc gacatggagc tgttcctcgc gggccgcccgg gtgctgggtca cccggggcagg      60
caaaggtata gggcgcgcca cgggtccaggc gctgcacgcg acgggcgcgc ggggtggtggc      120
tgtgagccgg actcaggcgg atcttgacag ccttgtccgc gagtgcgccg ggatagaacc      180
cgtgtgcgtg gacctgggtg actgggaggc caccgagcgg gcgctgggca gcgtggggcc      240
cgtggacctg ctggtgaaca acgccgtgt cgccctgctg cagcccttcc tggaggtcac      300
caaggaggcc tttgacagat cctttgaggt gaacctgcgt gcggtcatcc aggtgtcgca      360
gattgtggcc aggggcttaa tagcccgggg agtcccaggg gccatcgtga a      411

```

<210> 183

<211> 409

<212> DNA

<213> Homo sapien

<400> 183

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ggcacgagcc tacactctgg ccagagatac cacagtcaaa cctggagcca aaaaggacac      60
aaaggactct cgacccaaac tgccccagac cctctccaga ggttgggggtg accaactcat      120
ctggactcag acatatgaag aagctctata taaatccaag acaagcaaca aacccttgat      180
gattattcat cacttggatg agtgcccaca cagtcaagct ttaaagaaaag tgtttgctga      240
aaataaagaa atccagaaat tggcagagca gtttgcctc ctcaatctgg tttatgaaac      300
aactgacaaa cacctttctc ctgatggcca gtatgtccc aggattatgt ttgttgacc      360
atctctgaca gttagagccg atatcactgg aagatattca aatcgtctc      409

```

<210> 184

<211> 410

<212> DNA

<213> Homo sapien

<400> 184

```

ggcacgaggt cattccagca ccaacaggat ccaagccaga ttgattgggc tgcattggcc      60
caagcttggg ttgcccagg agaagcttca ggacagcaaa gcatggtaga acaaccacca      120
ggaatgatgc caaatggaca agatatgtct acaatggaat ctggtccaaa caatcatggg      180
aatttccaag gggattcaaa cttcaacaga atgtggcaac cagaatgggg aatgcatcag      240
caacccccac acccccctcc agatcagcca tggatgccac caacaccagg cccaatggac      300
attgttcctc cttctgaaga cagcaacagt caggacagtg ggggaatttg ccctgacaac      360
aggcatatat ttaaccagaa caatcacaac tttggtggac caccgataa      410

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<210> 185

<211> 411

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(411)

<223> n = A,T,C or G

<400> 185

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ggcacgagca cagatgtagt tttctctgcg cgtgtgcgtt ttccctcctc ccccgccctc      60
aggggtccag gccaccatgg cgtattaggg gcagcagtgc ctgcggcagc attggccttt      120
gcagcggcgg cagcagcacc aggtcttgca gcggcaaccc ccagcggctt aagccatggc      180
gcttctcagc gcattcagca gcagcgttgc tgtaaccgac aaagacacct tcgaattaag      240
cacattcctc gattccagca aagcaccgca acatgaccga aatgagcttc ctgagcagcg      300
aggtgttggg gggggacttg atgtccccct tcgacccgctc gggtttgggg gctgaagaaa      360
gcctangtct cttagatgat tacctggagg tggccaagca cttcaaacct c      411

```

<210> 186
 <211> 410
 <212> DNA
 <213> Homo sapien

<400> 186
 ggcacgagct tctagtcccg ccatggccgc tctcaccggg gacccccagt tccagaagct 60
 gcagcaatgg taccgcgagc accgctccga gctgaacctg cgccgcctct tcgatgccaa 120
 caaggaccgc ttcaaccact tcagcttgac cctcaacacc aacctggggc atatcctggt 180
 ggattactcc aagaacctgg tgacggagga cgtgatgcgg atgctggtgg acttgggcaa 240
 gtccagggggc gtggaggccg cccgggagcg gatgttcaat ggtgagaaga tcaactacac 300
 cgaggggtcga gccgtgctgc acgtggctct gcggaaccgg tcaaacacac ccatcctggt 360
 agacggcaag gatgtgatgc cagaggtcaa caaggttctg gacaagatga 410

<210> 187
 <211> 506
 <212> DNA
 <213> Homo sapien

<400> 187
 ctttcgtggc tcaactccctt tcctctgctg ccgctcggtc acgcttgtgc ccgaaggagg 60
 aaacagtgc agacctggag actgcagttc tctatccttc acacagctct ttcaccatgc 120
 ctggatcact tcctttgaat gcagaagctt gctggccaaa agatgtggga attgttgccc 180
 ttgagatcta ttttccttct caatatgttg atcaagcaga gttggaaaaa tatgatggtg 240
 tagatgctgg aaagtatacc attggcttgg gccaggccaa gatgggcttc tgcacagata 300
 gagaagatat taactctctt tgcagtactg tggttcagaa tcttatggag agaaataacc 360
 tttcctatga ttgcattggg cggctggaag ttggaacaga gacaatcatc gacaaatcaa 420
 agtctgtgaa gactaatttg atgcagctgt ttgaagagtc tgggaatata gatatagaag 480
 gaatcgacac aactaatgca tgctat 506

<210> 188
 <211> 506
 <212> DNA
 <213> Homo sapien

<400> 188
 gccacagagg cggcggagag atggccttca gcggttccca ggctccctac ctgagtcag 60
 ctgtcccctt ttctgggact attcaaggag gtctccagga cggacttcag atcactgtca 120
 atgggaccgt tctcagctcc agtggaaacca ggtttgctgt gaactttcag actggcttca 180
 gtggaaatga cattgccttc cacttcaacc ctcggtttga agatggaggg tacgtggtgt 240
 gcaacacgag gcagaacgga agctgggggc ccgaggagag gaagacacac atgcctttcc 300
 agaaggggat gccctttgac ctctgcttcc tgggtgcagag ctgagatttc aaggtgatgg 360
 tgaacgggat cctcttcgtg cagtacttcc accgcgtgcc cttccaccgt gtggacacca 420
 tctccgtcaa tggctctgtg cagctgtcct acatcagctt ccagcctccc ggcgtgtggc 480
 ctgccaaacc ggctcccatt acccag 506

<210> 189
 <211> 399
 <212> DNA
 <213> Homo sapien

<400> 189
 ctggacagga gaagagcctg gctgctgaag gcagggctga cacgaccacg ggcagcattg 60
 ctggagcccc agaggatgaa agatcgagga gcacagcccc ccaggcacca gagtgcctcg 120
 accctgccgg accggctggg ctctgtgagg cgacatctgg cctttcccag ggcccaggaa 180

aggaaacctt	ggaaagtgt	ctaatacgtc	tagactctga	aaaacccaag	aaacttcgct	240
tccacccaaa	gcagctgtac	ttctctgcca	ggcaggggtga	gctgcagaag	gtgcttctca	300
tgctgggtga	tggaattgat	cccaacttca	aaatggagca	ccaaagtaag	cgttcccat	360
tacatgctgc	tgcggaggct	ggccacgtgg	acatctgcc			399

<210> 190

<211> 401

<212> DNA

<213> Homo sapien

<400> 190

cggcgacggg	ggtggtgact	gagcggagcc	cggtgacagg	atgttggtgt	tggtattagg	60
agatctgcac	atcccacacc	ggtgcaacag	tttgccagct	aaattcaaaa	aactcctggg	120
gccagyaaaa	attcagcaca	ttctctgcac	aggaaacctt	tgcaccaaag	agagttatga	180
ctatctcaag	actctggctg	gtgatgttca	tattgtgaga	ggagacttcg	atgagaatct	240
gaattatcca	gaacagaaaag	ttgtgactgt	tggacagttc	aaaattgggtc	tgatccatgg	300
acatcaagtt	attccatggg	gagatatggc	cagcttagcc	ctggttcaga	ggcaatttga	360
tgtggacatt	cttatctcgg	gacacacaca	caaatttgaa	g		401

<210> 191

<211> 406

<212> DNA

<213> Homo sapien

<400> 191

tggcagccta	agccgtggga	gggttccagt	cgagaatggg	aagatgaaag	acttcagatg	60
gaacagaaat	aatgcctttt	tttgacaaac	gcagcagtg	gtgcctctag	cttgcaagag	120
cgttactccc	cttcatagct	ttaaaaggtt	ttgcactgc	gtgcagttag	agtagctaaa	180
tcttgtgtga	cgctccacaa	acacttgtaa	gaattttgca	gagaaagata	accgttgcca	240
cccaatgccc	cccacaggca	ttctactccc	cagtacctct	taggggtggga	gaaatgggtga	300
agagttgttc	ctacaacttg	ctaacttagt	ggacagggtg	gtagattagc	atcatccgga	360
tagatgtgaa	gaggacggct	gtttggataa	taattaagga	taaaat		406

<210> 192

<211> 316

<212> DNA

<213> Homo sapien

<400> 192

cccggggagg	ccctgggtcat	aaaactttta	attttactag	tgttacttaa	tgtatatctt	60
aaaaagagaa	tgcagtaact	aatgccctaa	atgtttgatc	tctgtttgtc	attacttttt	120
caaaattatt	tttttctgta	aagtataata	tataaaactt	cttgcttaaa	ttgaatttct	180
atattagtgg	ttaattgcag	tttattaaag	ggatcattat	cagtaatttc	atagcaactg	240
ttctagtgtt	ttgtgttttt	aaaacagaat	taggaatttg	agatatctga	ttatattttt	300
catatgaatc	acagac					316

<210> 193

<211> 146

<212> DNA

<213> Homo sapien

<400> 193

gaaacatgga	ctgccctta	aattttgact	gtcctaaaaa	cctatttctg	atttataata	60
tgctgcctga	taaagtgaca	ctagatgtac	cagctgagtg	tttaatcttc	ccatcacaga	120
tcagatttga	gcattaacag	gtattt				146

<210> 194
 <211> 405
 <212> DNA
 <213> Homo sapien

<400> 194
 cggatgtgct cactgacatt ctactccaag tcggagatgc agatccactc caagtcacac 60
 accgagacca agccccacaa gtgcccacat tgctccaaga ccttcgcca cagctcctac 120
 ctggcccagc acatccgtat acactcaggg gctaagccct acagttgtaa cttctgtgag 180
 aaatccttcc gccagctctc ccaccttcag cagcacaccc gaatccacac tggatgata 240
 ccatacaaat gtgcacaccc aggtgtgtgag aaagccttca cacaactctc caatctgcag 300
 tcccacagac ggcaacacaa caaagataaa cccttcaagt gccacaactg tcatcgggcg 360
 tacacggatg cagcctcact agaggtgcac ctgtctacgc acaca 405

<210> 195
 <211> 421
 <212> DNA
 <213> Homo sapien

<400> 195
 agaattcggc acgagctact ccttgcgcg c tggcactccg cagcctttaa ggctcgcgcg 60
 ggggccaggc aagagtttag catgaagagc ctcaagtccc gcctgaggag gcaggagtg 120
 cccggccccg cgtcgtctgg cgccgcccgc gccagcgcg atgcagcaga ttggaataaa 180
 tatgatgacc gattgatgaa agcagcagaa aggggggatg tagaaaaagt gacgtcaatc 240
 cttgctaaaa agggggtcaa tccaggcaaa ctagatgtgg aaggcagatc tgtcttccat 300
 gttgtgacct caaaggggaa tcttgagtgt ttgaatgcca tccttatata tggagttgat 360
 attacaacca gtgacactgc agggagaaat gctcttcacc tggctgctaa gtatggacat 420
 g 421

<210> 196
 <211> 476
 <212> DNA
 <213> Homo sapien

<400> 196
 agaattgac tatagattta atgcaatgcc tactaaaatc ccagtacgat tttttacagg 60
 catagacaat agacatagcc aaaacttatt ctaaaataca tatgaagatg cacaggccct 120
 agttatacaa tcttgacaaa gaagaataaa gtgggaagaa tctatttgat ttttaaggctt 180
 accatgtaac tacagtcac aagagagtgt ggtatcggca gacggtcaga catcacagatc 240
 aatggaatgt aacagaggac ccagaaatag gccacacag atatgctcaa tggatatttg 300
 acaagcgtgc aaaacaattc aatggaagaa taagctttca aaaaaatggc gttggagcaa 360
 ccggacatcc ataggaaaa atgaacccat acctaaacca taaaccttat ataaaaataa 420
 acacaaaatg aatcataggg ttaaatgtaa gctataaaac ttttagagaa aaacac 476

<210> 197
 <211> 503
 <212> DNA
 <213> Homo sapien

<400> 197
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 aacatgttct gcatgtccag ctcaaccggc ccaacaagag gaatgccatg aacaaggctc 120
 tctggagaga gatggttagag tgcttcaaca agatttcgag agacgctgac tgcggggcgg 180
 tggatgctc tgggtgcagga aaaatgttca ctgcaggatg tgacctgatg gacatggctt 240


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cggacatcct gcagcccaaa ggagatgatg tggcccggat cagctgggtac ctccgtgaca      300
tcatcactcg ataccaggag accttcaacg tcatcgagag gtgcccgaag cccgtgattg      360
ctgccgtcca tgggggctgc attggcggag gtgtggacct tgtcaccgcc tgtgacatcc      420
ggtagctgtgc ccaggatgct ttcttccagg tgaaggaggt ggacgtgggt ttggctgccc      480
atgtaggaac actgcagcgc ctg                                              503

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<210> 198
 <211> 168
 <212> PRT
 <213> Homo sapien

<400> 198

Phe	Val	Ala	His	Ser	Leu	Ser	Ser	Ala	Ala	Ala	Arg	Ser	Arg	Leu	Cys
1				5				10						15	
Pro	Lys	Glu	Glu	Thr	Val	Thr	Asp	Leu	Glu	Thr	Ala	Val	Leu	Tyr	Pro
		20					25						30		
Ser	His	Ser	Ser	Phe	Thr	Met	Pro	Gly	Ser	Leu	Pro	Leu	Asn	Ala	Glu
		35					40					45			
Ala	Cys	Trp	Pro	Lys	Asp	Val	Gly	Ile	Val	Ala	Leu	Glu	Ile	Tyr	Phe
	50					55				60					
Pro	Ser	Gln	Tyr	Val	Asp	Gln	Ala	Glu	Leu	Glu	Lys	Tyr	Asp	Gly	Val
65					70					75				80	
Asp	Ala	Gly	Lys	Tyr	Thr	Ile	Gly	Leu	Gly	Gln	Ala	Lys	Met	Gly	Phe
				85				90						95	
Cys	Thr	Asp	Arg	Glu	Asp	Ile	Asn	Ser	Leu	Cys	Met	Thr	Val	Val	Gln
			100					105					110		
Asn	Leu	Met	Glu	Arg	Asn	Asn	Leu	Ser	Tyr	Asp	Cys	Ile	Gly	Arg	Leu
		115					120					125			
Glu	Val	Gly	Thr	Glu	Thr	Ile	Asp	Lys	Ser	Lys	Ser	Val	Lys	Thr	
	130					135					140				
Asn	Leu	Met	Gln	Leu	Phe	Glu	Glu	Ser	Gly	Asn	Thr	Asp	Ile	Glu	Gly
145					150					155					160
Ile	Asp	Thr	Thr	Asn	Ala	Cys	Tyr								
				165											

<210> 199
 <211> 168
 <212> PRT
 <213> Homo sapien

<400> 199

His	Arg	Gly	Gly	Gly	Glu	Met	Ala	Phe	Ser	Gly	Ser	Gln	Ala	Pro	Tyr
1				5				10						15	
Leu	Ser	Pro	Ala	Val	Pro	Phe	Ser	Gly	Thr	Ile	Gln	Gly	Gly	Leu	Gln
		20						25					30		
Asp	Gly	Leu	Gln	Ile	Thr	Val	Asn	Gly	Thr	Val	Leu	Ser	Ser	Ser	Gly
		35					40					45			
Thr	Arg	Phe	Ala	Val	Asn	Phe	Gln	Thr	Gly	Phe	Ser	Gly	Asn	Asp	Ile
	50					55				60					
Ala	Phe	His	Phe	Asn	Pro	Arg	Phe	Glu	Asp	Gly	Gly	Tyr	Val	Val	Cys
65					70					75				80	
Asn	Thr	Arg	Gln	Asn	Gly	Ser	Trp	Gly	Pro	Glu	Glu	Arg	Lys	Thr	His
			85					90						95	
Met	Pro	Phe	Gln	Lys	Gly	Met	Pro	Phe	Asp	Leu	Cys	Phe	Leu	Val	Gln
			100					105					110		

Ser Ser Asp Phe Lys Val Met Val Asn Gly Ile Leu Phe Val Gln Tyr
 115 120 125
 Phe His Arg Val Pro Phe His Arg Val Asp Thr Ile Ser Val Asn Gly
 130 135 140
 Ser Val Gln Leu Ser Tyr Ile Ser Phe Gln Pro Pro Gly Val Trp Pro
 145 150 155 160
 Ala Asn Pro Ala Pro Ile Thr Gln
 165

<210> 200
 <211> 132
 <212> PRT
 <213> Homo sapien

<400> 200
 Gly Gln Glu Lys Ser Leu Ala Ala Glu Gly Arg Ala Asp Thr Thr Thr
 1 5 10 15
 Gly Ser Ile Ala Gly Ala Pro Glu Asp Glu Arg Ser Gln Ser Thr Ala
 20 25 30
 Pro Gln Ala Pro Glu Cys Phe Asp Pro Ala Gly Pro Ala Gly Leu Val
 35 40 45
 Arg Pro Thr Ser Gly Leu Ser Gln Gly Pro Gly Lys Glu Thr Leu Glu
 50 55 60
 Ser Ala Leu Ile Ala Leu Asp Ser Glu Lys Pro Lys Lys Leu Arg Phe
 65 70 75 80
 His Pro Lys Gln Leu Tyr Phe Ser Ala Arg Gln Gly Glu Leu Gln Lys
 85 90 95
 Val Leu Leu Met Leu Val Asp Gly Ile Asp Pro Asn Phe Lys Met Glu
 100 105 110
 His Gln Ser Lys Arg Ser Pro Leu His Ala Ala Ala Glu Ala Gly His
 115 120 125
 Val Asp Ile Cys
 130

<210> 201
 <211> 120
 <212> PRT
 <213> Homo sapien

<400> 201
 Met Leu Val Leu Val Leu Gly Asp Leu His Ile Pro His Arg Cys Asn
 1 5 10 15
 Ser Leu Pro Ala Lys Phe Lys Lys Leu Leu Val Pro Gly Lys Ile Gln
 20 25 30
 His Ile Leu Cys Thr Gly Asn Leu Cys Thr Lys Glu Ser Tyr Asp Tyr
 35 40 45
 Leu Lys Thr Leu Ala Gly Asp Val His Ile Val Arg Gly Asp Phe Asp
 50 55 60
 Glu Asn Leu Asn Tyr Pro Glu Gln Lys Val Val Thr Val Gly Gln Phe
 65 70 75 80
 Lys Ile Gly Leu Ile His Gly His Gln Val Ile Pro Trp Gly Asp Met
 85 90 95
 Ala Ser Leu Ala Leu Leu Gln Arg Gln Phe Asp Val Asp Ile Leu Ile
 100 105 110
 Ser Gly His Thr His Lys Phe Glu

115

120

<210> 202

<211> 135

<212> PRT

<213> Homo sapien

<400> 202

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Arg Met Cys Ser Leu Thr Phe Tyr Ser Lys Ser Glu Met Gln Ile His
 1           5           10           15
Ser Lys Ser His Thr Glu Thr Lys Pro His Lys Cys Pro His Cys Ser
 20           25           30
Lys Thr Phe Ala Asn Ser Ser Tyr Leu Ala Gln His Ile Arg Ile His
 35           40           45
Ser Gly Ala Lys Pro Tyr Ser Cys Asn Phe Cys Glu Lys Ser Phe Arg
 50           55           60
Gln Leu Ser His Leu Gln His Thr Arg Ile His Thr Gly Asp Arg
 65           70           75           80
Pro Tyr Lys Cys Ala His Pro Gly Cys Glu Lys Ala Phe Thr Gln Leu
 85           90           95
Ser Asn Leu Gln Ser His Arg Arg Gln His Asn Lys Asp Lys Pro Phe
100           105           110
Lys Cys His Asn Cys His Arg Ala Tyr Thr Asp Ala Ala Ser Leu Glu
115           120           125
Val His Leu Ser Thr His Thr
130           135

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<210> 203

<211> 135

<212> PRT

<213> Homo sapien

<400> 203

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Leu Leu Leu Ala Arg Trp His Ser Ala Ala Phe Lys Val Arg Ala Gly
 1           5           10           15
Ala Arg Gln Glu Leu Ala Met Lys Ser Leu Lys Ser Arg Leu Arg Arg
 20           25           30
Gln Asp Val Pro Gly Pro Ala Ser Ser Gly Ala Ala Ala Ser Ala
 35           40           45
His Ala Ala Asp Trp Asn Lys Tyr Asp Asp Arg Leu Met Lys Ala Ala
 50           55           60
Glu Arg Gly Asp Val Glu Lys Val Thr Ser Ile Leu Ala Lys Lys Gly
 65           70           75           80
Val Asn Pro Gly Lys Leu Asp Val Glu Gly Arg Ser Val Phe His Val
 85           90           95
Val Thr Ser Lys Gly Asn Leu Glu Cys Leu Asn Ala Ile Leu Ile His
100           105           110
Gly Val Asp Ile Thr Thr Ser Asp Thr Ala Gly Arg Asn Ala Leu His
115           120           125
Leu Ala Ala Lys Tyr Gly His
130           135

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<210> 204

<211> 167

<212> PRT

<213> Homo sapien

<400> 204

Ala Leu Gly Glu Ala Pro Asp His Ser Tyr Glu Ser Leu Arg Val Thr
 1 5 10 15
 Ser Ala Gln Lys His Val Leu His Val Gln Leu Asn Arg Pro Asn Lys
 20 25 30
 Arg Asn Ala Met Asn Lys Val Phe Trp Arg Glu Met Val Glu Cys Phe
 35 40 45
 Asn Lys Ile Ser Arg Asp Ala Asp Cys Arg Ala Val Val Ile Ser Gly
 50 55 60
 Ala Gly Lys Met Phe Thr Ala Gly Ile Asp Leu Met Asp Met Ala Ser
 65 70 75 80
 Asp Ile Leu Gln Pro Lys Gly Asp Asp Val Ala Arg Ile Ser Trp Tyr
 85 90 95
 Leu Arg Asp Ile Ile Thr Arg Tyr Gln Glu Thr Phe Asn Val Ile Glu
 100 105 110
 Arg Cys Pro Lys Pro Val Ile Ala Val His Gly Gly Cys Ile Gly
 115 120 125
 Gly Gly Val Asp Leu Val Thr Ala Cys Asp Ile Arg Tyr Cys Ala Gln
 130 135 140
 Asp Ala Phe Phe Gln Val Lys Glu Val Asp Val Gly Leu Ala Ala His
 145 150 155 160
 Val Gly Thr Leu Gln Arg Leu
 165

<210> 205

<211> 381

<212> DNA

<213> Homo sapien

<400> 205

aaatttgagg tcatcgcttg ttctgaaaac tagatgcacc aaccgtatca ttatttgttt 60
 gaggaaaaaa agaaatctgc attttaattc atgttggtca aagtcgaatt actatctatt 120
 tatcttatat cgtagatctg ataaccctat ctaaaagaaa gtcacacgct aaatgtattc 180
 ttacatagtg cttgtatcgt tgcatttggt ttaatttggtg gaaaagtatt gtatctaact 240
 tgtattactt tggtagtttc atctttatgt attattgata tttgtaattt tctcaactat 300
 aacaatgtag ttacgctaca acttgccata aacattcaaa cttgttttct tttttctgtt 360
 gttttctttg ttaattcatt t 381

<210> 206

<211> 514

<212> DNA

<213> Homo sapien

<400> 206

aaaagtaaat tgcataaaat tacatccaat ttctttctct aaaccaacat attcttcacc 60
 ttcacaaagc aaacacatgg tgcactgaaa ccgaggtggt accagcttta catactgttc 120
 tgccatttgt ggggggtgca accacaacat aagtcagaaa aaaagctatc cagcttttcg 180
 tggaatctgg tgaagtttac acttagcgat aagcctctaa gcctgaactt agcagggcta 240
 gcaaaaacttt atttatttcc taactcctat tatttttagaa tggttttcaa aataatactg 300
 caagttccta attgaaatac aaaacagaac aaaaagctgt gagaaatctt tttttttctt 360
 tggctcctta aagacttggg ataatttata ttagtggtgc atacatttta ccttctacat 420
 tttgatgtac ttgctcttga aagcactaga acaaattaat tgaaataaaa cctctctgaa 480
 accatttgaa tctttgatcc taccatagag tttt 514

<210> 207
<211> 522
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(522)
<223> n = A,T,C or G

<400> 207
caagctttttg gtgcatagca gccngcctgg aagcattctg agtgctctgt ctgccctggg 60
gggttttcatt atcctgtctg tcaaacaggc caccttaa at cctgcctcac tgcagtgtga 120
gttggacaaa aataatatac caacaagaag ttatgtttct tacttttatc atgattcact 180
ttataccacg gactgctata cagccaaagc cagtctggct ggaactctct ctctgatgct 240
gatttgcact ctgctggaat tctgcctagc tgtgctcact gctgtgctgc ggtggaaaca 300
ggcttactct gacttccctg ggagtgtact tttcctgcct cacagttaca ttggtaattc 360
tggcatgtcc tcaaaaatga ctcatgactg tggatatgaa gaactattga cttcttaaga 420
aaaaagggag aaatattaat cagaaagttg attccttatga taatatggaa aagttaacca 480
ttatagaaaa gcaaagcttg agtttcctaa atgtaagctt tt 522

<210> 208
<211> 278
<212> DNA
<213> Homo sapien

<400> 208
aaaatgcact accccttttt tccaacacgg agcttaaaac aaattaatga aagagtggaa 60
aattcaaaat aagggaaga gataaggttt tttttttttt tctttaaga tagactcagg 120
ataggtagat agctttcact gatgtagatg tggaaataat tattacttca ggaaaaaat 180
tcccaaacat cttatgaaaa agtatacaac tctacttcaa aatatgctat ttactcactg 240
ccaaagacag ttttatttga aatcttgttt ctgtattt 278

<210> 209
<211> 234
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(234)
<223> n = A,T,C or G

<400> 209
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gtgaaactgc cctttccttt ctgttctatg agtgatgatg tgtttgagaa aatgtggggc 120
tatgggttcag gcgcacttca catgtgcaaa gatggagaaa gcactcacct acacgtttag 180
gctcagaatg ttgattgaaa cattttgaat gatcaaaaat aaaatgttat tttt 234

<210> 210
<211> 186
<212> DNA
<213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(186)
 <223> n = A,T,C or G

<400> 210
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 tctctgtaca aagaaatata catgcaaaat aatgtaaaaa tttaactgaa ataataaaag 120
 aaacaatata caaataaaaa ttatgagggt acgaatacac atccagtttc gaatccaatt 180
 tctttt 186

<210> 211
 <211> 403
 <212> DNA
 <213> Homo sapien

<400> 211
 aaaaattgggt aaaatattta agtacaaaat aagtagcttc cagcgagggt ttatatccat 60
 agtaagagca cacaatagat attactagca cacatgggtt atctgggagc gctatagcta 120
 caataaacct aattatggaa cagaaatttg cattctgttt ccagtgtctac tacactccta 180
 ctttctcaaa agtctgtctt attaatatca gctcagtgcg gtttactatg aatagttttat 240
 gtctgtgatg caaagcatta attgttctct ttttacaac atacattttt ttcataagga 300
 agactggggg aaaaccaga aacatacaga gaaaaggaaa gcatcatcaa atatatgtta 360
 aaaattaaga tgatgtttac tactagtcac cctacaacaa ttt 403

<210> 212
 <211> 345
 <212> DNA
 <213> Homo sapien

<400> 212
 cctctttatg agttcattac tgctgttcag tctcggcaca cagacacccc tgtgcaccgg 60
 ggtgtacttt ctactctgat cgctgggcct gtggttgaga taagtcacca gctacggaag 120
 gtttctgacg tagaagagct taccctccca gagcatcttt ctgatcttcc accattttca 180
 aggtgtttta taggaataat aataaagtct tcgaatgtgg tcaggtcatt tttggatgaa 240
 ttaaaggcat gtgtggcttc taatgatatt gaaggcattg tgtgcctcac ggctgctgtg 300
 catattatcc tggttattaa tgcaggtaaa cataaaagct caaaa 345

<210> 213
 <211> 318
 <212> DNA
 <213> Homo sapien

<400> 213
 aaaatgtttt attattttga aaataatggt gtaattcatg ccaggggactg acaaaagact 60
 tgagacagga tggttattct tgtcagctaa ggtcacattg tgcctttttg accttttctt 120
 cctggactat tgaaatcaag cttattggat taagtgtat ttctatagcg attgaaaggg 180
 caatagttaa agtaatgagc atgatgagag tttctgttaa tcatgtatta aaactgattt 240
 ttagctttac aaatatgtca gtttgcagtt atgcagaatc caaagtaaat gtccctgctag 300
 ctagttaagg attgtttt 318

<210> 214
 <211> 462
 <212> DNA
 <213> Homo sapien

<400> 214

aaacacatct	ggttctggca	gcaagttata	ttatgcattt	agagcaatag	gtgccctgaa	60
agttattggt	gctttttttg	tttttttttt	cagtttgtgc	gtgtcacttg	aatcagaaac	120
caaacacatg	taaaaaata	tcacctctca	tgccccccat	taactctctc	tccagaaggt	180
gacaatgtta	gtgaactcaa	gactctcact	gatgatggta	ttttacaatg	aaaacacaag	240
gaaacccttt	gaggtccaat	tttcacatca	tattctccaa	atagtaaaat	agcagctcta	300
catgttgatg	aaaagaaatt	tcaatttctt	cctatttgtt	tttactcata	tcaacattaa	360
tatgtatctg	gatttattaa	tttccaaaaa	gaaaatttta	gttaccaaat	atttcagaaa	420
tttaataaag	cattatatat	atgtaattag	cacttatcta	cc		462

<210> 215

<211> 280

<212> DNA

<213> Homo sapien

<400> 215

aaacttttct	gaaacgatta	gctgtagcca	aattatgtgg	ttacgttttg	ctacattaga	60
atttgaaaaat	gcaatatgtg	tggtaaatct	actgtttgaa	atttataatg	gtctctgata	120
tgattcgaat	tttggttaact	tttgaaagtt	attttccccc	tttagtcatg	gatttctatt	180
tgttttttta	tggttaatttt	tctagaaagc	atctgaattg	actaggcttt	tcctatataa	240
aaaactcaaa	acttggttaac	tctgtacttt	aataaaattt			280

<210> 216

<211> 210

<212> DNA

<213> Homo sapien

<400> 216

aaaatctctg	gcttcaaagt	ttcttgggga	aaggtcgggt	tacctcacat	tttttgtttc	60
cattagtaat	attctaggta	cctcacaaaa	tgtattatgg	tgccatggct	gttagttttt	120
agtgagtgtc	gtaggattaa	ttcgaaaata	ggcagaattc	cattcctccc	aagggtggcaa	180
aaattagcta	tactgatgta	attgtcattt				210

<210> 217

<211> 398

<212> DNA

<213> Homo sapien

<400> 217

ctggagctgc	tagaacttga	gatgagggca	agagcgatta	aagccctaata	gaaagctggt	60
gatataaaaa	agccagccta	ggtatttaac	ttgattttga	attttaggta	tgtttgaaca	120
aagccacatc	atttaatttt	gtatctaaaa	tttatttggg	gtcttatatg	ttattttctca	180
tgtaaccctt	attaggactc	atttttagccc	taaattacct	gtggctgttt	ctttttattt	240
ttttgactac	ttttatatta	taaatgtgtg	ttactgtctt	atgaattcat	ggcaatatag	300
ttggatagcc	tggatacttt	gttagatgag	tatttagctg	tgtctgcaaa	tcttaaaaagc	360
cattagcaaa	gagtcgtggt	atttttttct	ttattttt			398

<210> 218

<211> 487

<212> DNA

<213> Homo sapien

<400> 218

ctgccgccgg	tcaggctggt	taaagatcag	gtcccccagg	accttgcgat	ttatgtcgcc	60
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attctccagc	aagacctcag	tgccgaagac	ctctacgatg	cgccggtggg	caggggtatcc	120
tggctgcacg	acgtgccggg	ccatcacgtc	cacgtcaatc	accgcacagc	ccagtttcag	180
tggtttttaca	catttatattg	ttataatctc	acaataacta	taaattaggt	agaacaggaa	240
atgaggtttg	gagaagatac	ttgacttatc	cgaccatctg	tacttgtccc	atagtaagga	300
gcctcaagca	gagacaaagg	aggaagttgc	ctatgttgta	tggtttacag	gccataaatg	360
aatgtcatct	ttttcctccc	ctggggaaaa	atgtctcaaa	aatcccacca	taggacatga	420
catctccaga	acctctatta	caaaatacac	atttcctgta	gaggggtaac	aaatttgggg	480
taacctg						487

<210> 219
 <211> 390
 <212> DNA
 <213> Homo sapien

<400> 219						
aaaaaataca	ccacacgata	caactcaata	caggagtatt	tcttctcaaa	ttcttctagc	60
accatcaaca	ttcttcaagt	atctgaaata	ctattaatta	gcacctttgt	attatgaaca	120
aaacaaaaca	aggacctcag	ttcatctctg	tctaggtcag	cacctaaaca	tgtggatcac	180
actcatggga	aagtgttttg	aggtagttta	aacctttgga	agtttgggtt	ttaaacttcc	240
ctctgtggaa	gatattcaaa	agccacaagt	ggtgcaaatg	tttatgggtt	ttatttttca	300
atttttattt	tggttttctt	acaaagggtg	acattttcca	taacagggtg	aagagtgttg	360
aaaaaaaaagt	tcaaattttt	gggggagcgg				390

<210> 220
 <211> 341
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1) ... (341)
 <223> n = A,T,C or G

<400> 220						
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gtaaatactg	tgaaatacct	tttctnnnca	aaaggcaaat	attgaagttg	tttatcaact	120
tcgctagaaa	aaaaaaaaaca	cttggcatat	aaaatattta	agtgaaggag	aagtctaacg	180
ctgaactnnn	aatgaaggga	aattgtttat	gtgttatgaa	catccaagtc	tttcttcttt	240
tttaagttgt	caaagaagct	tccacaaaat	tagaaaggac	aacagttctg	agctgtaatt	300
tcgccttaaa	ctctggacac	tctatatgta	gtgcattttt	a		341

<210> 221
 <211> 234
 <212> DNA
 <213> Homo sapien

<400> 221						
ccagggggaa	ttgagggagg	ctctaagcta	ggggcactgc	atggtgggac	aggatggccc	60
cttgaggact	gaaccctggg	gagaagacaa	acagtaataa	taaaaacaaa	taacaagtac	120
tttaagaatg	gattgtatga	cctatagtga	cagatgacat	cactaatact	gaaagcttct	180
tatattaata	attttggcaa	aatgtcattt	tgtaatatag	tatatgcttt	ccag	234

<210> 222
 <211> 186
 <212> DNA

<213> Homo sapien

<400> 222

aaattttcat	tgagttgtcc	atctccagca	tatagggctt	caggagcaga	gcagaccttg	60
tttttagtgg	ttccatggga	taaaatggga	ttggaggagc	tagaagaatt	caggggtctgg	120
tccaatctgc	cagtccttcc	gaaatatcga	aaatacacca	gggctgctat	atcagagcca	180
ccctgg						186

<210> 223

<211> 486

<212> DNA

<213> Homo sapien

<400> 223

ccataagcag	ataagtagca	gttcaactgg	atgtctctct	tctccaaatg	ctacagtaca	60
aagccctaag	catgagtggg	aaatcggtgc	ttcagaaaag	acttcaaata	acacttactt	120
gtgcctggct	gtgctggatg	gtatattctg	tgatcttttt	cttcatggga	gaaacagccc	180
acagagctca	ccaacaagta	ctccaaaact	aagtaagagt	ttaagctttg	agatgcaaca	240
agatgagcta	atcgaaaagc	gcattgtctc	tatgcagtac	gcacgatctg	gtctgggaac	300
agcagagatg	aatggcacaac	tcattagctgc	aggtggctat	aacagagagg	aatgtcttcg	360
aacagtcgaa	tgctataatc	cacatacaga	tcactggctc	tttcttgctc	ccatgagaac	420
accaagagcc	cgatttcaaa	tggtgttact	catgggccag	ctctatgtgg	taggtggatc	480
aatgg						486

<210> 224

<211> 322

<212> DNA

<213> Homo sapien

<400> 224

aaatgttcac	tatgtcattt	agtgtccaac	tttacggata	ggttgactat	ctaaataggc	60
attttttagtc	attaaaaaaa	aatttagtca	ccaggaggat	ccctataact	caaaaataact	120
tgtttgtaaa	agaaaatttg	tttacttacc	cattagtaag	ttcctgcata	ttcattataa	180
gatggcaaat	caaacttttc	taggatgaag	acagcttatt	tttaagttgt	atagtcttag	240
ttggtttagg	gtctcaattt	taattaataa	aatacttggg	ttttatttgc	ttgtcctttt	300
gaattcctgt	tttaataatt	tt				322

<210> 225

<211> 489

<212> DNA

<213> Homo sapien

<400> 225

aaatgtagga	ataaaatggc	tggtcatctaa	gcacttttagt	aaaagagggt	tttacaaaata	60
actaaggatt	gtagagcttc	cttctctttt	tttttctttt	tctttctttt	gtttttacatg	120
aactcaactt	attcctaaca	tttgtctacc	tcaaaagaaat	ttcaagatta	tttagataaac	180
atggatatgt	gccaaatcct	ttgagctggt	aagatgataa	tttcttgctt	tcctcctaca	240
tcttctcctc	ccactccctc	ctttgggtgtg	aatattgggt	tccaatttaa	gacctttttt	300
ttttttttcc	agttttgttt	agcttattat	aggtttttggg	ggaacttttg	cattttgttaa	360
tctttcaaat	cattcttcac	ccttcctcac	atcagcttcc	tgcttttccc	agtgttttac	420
tgtaaatgtg	gtagcatatg	acaaatcttg	agctgacttt	cctcttcact	gatgtcatct	480
tgagctctt						489

<210> 226

<211> 398

<212> DNA

<213> Homo sapien

<400> 226

caagggccca	ccgcagagca	cacctatgct	atggggagcc	ctgctggcag	ccccgagagc	60
catgccatgg	cctgcaggag	ccaggctcct	gtgtggatga	agtcctctct	cctcrgtgcc	120
ttgatccctt	gggggtgcct	ttggtcacat	cttctgtcct	ttcctgtctc	tgaaatagtc	180
atcactcccc	ttgactctct	ctgttcacgt	cttctcagtc	tcagagatta	acttctgtaa	240
ggagtttaaat	ctgggggttcc	aagaaaaaca	gttccttggt	aacatagcac	tgactttgca	300
acaatagaaa	actaacaat	gagcaacaat	ataaagagta	gaggtagttc	tcattggggtg	360
taacttcaac	ccattctgct	tgtgggttaga	atttataa			398

<210> 227

<211> 535

<212> DNA

<213> Homo sapien

<400> 227

ctgctgcata	gaaaatatgc	taacatacaa	cagtcaggtt	taagcctgtg	catagagaag	60
ataaagcact	tatggtaact	gcaaatggta	acgagtcctt	aaggtttgta	caacctagta	120
tgggtccata	aggaaaaact	gtagtagaaa	tggttaggac	aaacaataaa	gtagaaacag	180
gggggaaact	tgagaagaga	agaaagaagc	aagaaaaaaa	gactttcaat	tgtataaaat	240
tcacaaacca	gtaaagtata	aagacaccat	ggagaaatgg	ttaactctgc	cccaaacc	300
caacagcaaa	caaaaccaga	atgaataagc	ctttggcaga	caattttaga	aatttgaatg	360
ttacatttct	caataattca	caaacaatat	atttatatgg	atatttatat	taaatattgg	420
gaaaccaatg	ttgtaaattt	gatgcttata	atgctttagc	caatgagagc	acaatgatat	480
caatcaagct	aaatgaatgc	tgggtgtatc	acaacagtcg	tcatttatga	aacaa	535

<210> 228

<211> 301

<212> DNA

<213> Homo sapien

<400> 228

aaacaataaa	caccatcaac	cttattgact	ttattgtccc	tcaaattata	ttgactgttg	60
tgattccatc	aagtttgtac	actcttttct	ctccctgttt	tcagcaaca	aattgcgaag	120
tgcttttgtt	tgtttgtttt	cgtttggtta	aagcttattg	ccatgctggg	gcggctatgg	180
agactgtctg	gaaggcttgg	aatggtttat	tgcttatggg	aaaatttgcc	tgatttctta	240
caggcagcgt	ttggaaacct	tttattatat	agttgtttac	atacttataa	gtctatcatt	300
t						301

<210> 229

<211> 420

<212> DNA

<213> Homo sapien

<400> 229

aaagttgctt	tgctggaagt	ttttataagg	aatctcagat	taaaccttta	gaagtttaaat	60
tgacactagg	aagccaaacc	aaggctgact	tcagactttg	ttttagtagac	ctgtgggttt	120
attacctatg	ggtttatatc	ctcaaatacg	acattctagt	caaagtcttg	gtaatataac	180
caatgttttc	aaatgtattc	tgtcatacaa	agagcagatt	tttattgaac	ttgtgcaata	240
actatattac	catacaatat	aaatattcat	gaatagtttc	ccaagtctgg	agcgaccaca	300
tagggagaaa	atgcaaatgt	ctcaattttt	gttcacaaaa	gtatatttta	tcaaattgct	360
gtaagctgtg	gatagcttaa	aagaaaaaaa	gtttcctgaa	atctggggaa	caagacattt	420

<210> 230
 <211> 419
 <212> DNA
 <213> Homo sapien

<400> 230
 gtgaagtcct aaagcttgca ttccaccagc ttctacaata gccggcttat tactagagca 60
 gacagatagc accttcagca ctctgcttgt ggtccacagt agtttttcgt aagtataggt 120
 cctcattata ttactaaaag cttgggggtcc accactagcc agtatgatga gcttgctttc 180
 ttggttgcca taagctaaaa tttgaaggca gtctgtcgta atagccaaga atttaacatt 240
 tgttttgttg agcaaggcaa ccattttctg cagcccacca gctaaacgca ctgccatttt 300
 agctccttct tgatgtaata aaaggttgtg gagagttgta atggcataaaa acaacacaga 360
 atccactggt gaaccaagca ttttcaccag ggcaggaaatg cctccagact taaagatgg 419

<210> 231
 <211> 389
 <212> DNA
 <213> Homo sapien

<400> 231
 ttgttcagag ccctgggtgga tcttgcaatc cagtgcccta caaaggctag aacactacag 60
 gggatgaatt cttcaaatag gagccgatgg atctgtggtc ctttgggact catcaaagcc 120
 ttggttttagc attttgtcag ttttatcttc agaaattctc tgcgattaag aagataattt 180
 attaaagggt gtccttctta cctctgtggg gtgtgtcgcg cacacagctt agaagtgcta 240
 taaaaaagga aagagctcca aattgaatca cctttataat ttaccattt ctatacaaca 300
 ggcagtggaa gcagtttcag agaacttttt gcctgcttat ggttgatcag ttaaaaaaga 360
 atgttacagt aacaaataaa gtgcagttt 399

<210> 232
 <211> 397
 <212> DNA
 <213> Homo sapien

<400> 232
 ccaggataat atacacaggt ttgcagctaa aactgtgcac agtgggtcat tgatgctagt 60
 cacagtggaa ctgaaggaag gctctacagc ccagcttatc ataaacactg agaaaactgt 120
 gattggctct gttctgctgc gggaactgaa gcctgtcctg tctcaggggt aacctgctta 180
 catctggact ttagaatctg gcacacaaca aaagtgcctg gcacccacta ctgctgcctt 240
 tcatttataa taatagccct tccatctggc agtgggggaa gaatacactc ttgacattct 300
 tgtctcctgc tttagaatgc tagtgtgtat ctatcatgta tgcaatactt tccccctttt 360
 tgctttgcta accaaagagc atatatttta ctgtcag 397

<210> 233
 <211> 508
 <212> DNA
 <213> Homo sapien

<400> 233
 cgaggagtgc cttaagtgcg aggacctcaa agtgggacaa tatatttgta aagatccaaa 60
 aataaatgac gctacgcaag aaccagttaa ctgtacaaac tacacagctc atgtttcctg 120
 ttttcagca cccaacataa cttgtaagga ttccagtggc aatgaaacac attttactgg 180
 gaacgaagt gggtttttca agcccataac ttgccgaaat gtaaatggct attcctacaa 240
 agtggcagtc gcattgtctc tttttcttgg atgggtggga gcagatcgat ttaccttgg 300
 ataccctgct ttgggtttgt taaagttttg cactgtaggg ttttgtggaa ttgggagcct 360
 aattgatttc attcttattt caatgcagat tgttggaact tcagatggaa gtagttacat 420

tatagattac tatggaacca gacttacaag actgagtatt actaatgaaa catttagaaa	480
aacgcaatta tatccataaa tatttttt	508

<210> 234
 <211> 358
 <212> DNA
 <213> Homo sapien

<400> 234	
aaatgttggt attcaaaacc aaagatataa ccgaaaggaa aaacagatga gacataaaat	60
gatttgcaag atgggaaata tagtagttta tgaatgtaaa ttaaattcca gttataatag	120
tggctacaca ctctcactac acacacagac cccacagtcc tatatgccac aaacacattt	180
ccataacttg aaaatgagta ttttgcatac ctccagttcag gatatgtttt ttacaagtta	240
atcctaaagt cataaagcaa gaagctattc atagtacaag attttatttg ctaagcttta	300
caaattaaac tctaaaaaat tattacaatg atactgaaag atattttatt ggcctttt	358

<210> 235
 <211> 482
 <212> DNA
 <213> Homo sapien

<400> 235	
gaagaaagtt agatttacgc cgatgaatat gatagtgaaa tggatttttg cgtaggtttg	60
gtctagggtg tagcctgaga ataggggaaa tcagtgaatg aagcctccta tgatggcaaa	120
tacagctcct attgatagga catagtggaa gtgagctaca acgtagtacg tgcgtgtag	180
tacgargtct agtgatgagt ttgctaatac aatgccagtc aggccaccta cggtgaaaag	240
aaagatgaat cctagggctc agagcactgc agcagatcat ttcataattgc ttccgtggag	300
tgtggcgagt cagctaaata ctttgacgcc ggtggggata gcgatgatta tggtagcgga	360
ggtgaaatat gtcgtgtgt ctacgtctat tcctactgta aatatatggt gtgctcacac	420
gataaacctt aggaagccaa ttgatatcat agctcagacc atacctatgt atccaaatgg	480
tt	482

<210> 236
 <211> 149
 <212> DNA
 <213> Homo sapien

<400> 236	
cctcttcatt gttcacatgt cacaggagga ggctctgagc aaaggccact ggcaagttag	60
ggcaacacca agaaggctct gcggagagac tcctgtggg ttggggcctg gcaggaacgg	120
tgctgtgga ctgtttatgg tctgtccag	149

<210> 237
 <211> 391
 <212> DNA
 <213> Homo sapien

<400> 237	
gaagctaaat ccaaagaaat atgaaggtgg ccgtgaatta agtgatttta ttagctatct	60
acaaagagaa gctacaaacc cccctgtaat tcaagaagaa aaaccaaga agaagaagaa	120
ggcacaggag gatctctaaa gcagttagcca aacaccactt tgtaaaagga ctcttccatc	180
agagatggga aaaccatttg ggaggactag gacccatatt ggaattatta cctctcaggg	240
ccgagaggac agaattggata taatctgaat cctgttaaat tttctctaaa ctgtttctta	300
gctgcactgt ttatggaaat accaggacca gtttatgttt gtggtttttg gaaaaattat	360
ttgtgttggg ggaaatgttg tgggggtggg g	391

<210> 238
<211> 374
<212> DNA
<213> Homo sapien

<400> 238
aaaaaaca aa acaatgtaag taaaggatat ttctgaatct taaaattcat cccatgtgtg 60
atcataaact cataaaaaata attttaagat gccggaaaag gatactttga ttaaataaaa 120
acactcatgg atagttaaaa actgtcaaga ttaaaattta atagtttcat ttatttggtta 180
ttttatttgt aagaaatagt gatgaacaaa gatccttttt catactgata cctgggttga 240
tattatttga tgcaacagtt ttctgaaatg atatttcaaa ttgcatcaag aaattaaaat 300
catctatctg agtagtcaaa atacaagtaa aggagagcaa ataaacaaca tttggaaaaa 360
aaaaaaaaaa aaaa 374

<210> 239
<211> 200
<212> DNA
<213> Homo sapien

<400> 239
aaagatgtct ttgaccgcat atgtactgga aatttcaaac gtggatcttc ccaggttgta 60
gtctttgtgt tatgatcaat gaagaagggc cggccgtttg gcgctatcct catttcccag 120
ccgggtggca agaagctctg tgtgactttg tgttggtggt tgggggagtt gtaagggtgat 180
ggctgtgggg actgtggggt 200

<210> 240
<211> 314
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(314)
<223> n = A,T,C or G

<400> 240
ctggtaaact gtccaaaaca aggttccaaa taacacctct tactgattta ccctacccat 60
acatatncca natagntttt gatcaaaaac atgaaatana tccacctgct tattttaagc 120
atattaaaaa ggaaactaat tggaccattt tctatttgct tattttatac aaaaaggcta 180
cacaattgat acactctatt cagataacaa tcaattagag tgantatgaa ttactggcga 240
caccatcact caattcttaa aaattagaaa ttgctgtagc agtattcact ataacttaac 300
actaccgaga gact 314

<210> 241
<211> 375
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(375)
<223> n = A,T,C or G

<400> 241

```

ccaagtcctt ggagttatag gatattcatt acttcctctc attgtaatag cccctgtact      60
tttggtgggt ggatcatttg aagtgggtgc tacacttata aaactgtttg gtgtgttttg      120
ggctgcctac agtgcctgct cattgttagt ggggtgaagaa ttcaagacca aaaagcctct      180
tctgatttat ccaatctttt tattatacat ttatcttttg tcgttatata ctggtgtgtg      240
atccaagtta tacatgaata gaaaaagatg gtgttaaatt tgtgtgtagg ctgggaattc      300
tngctaaagg aatggnaaaa aacctgtntt tgnaaaattn acntgtccca aagnnaagga      360
anctaaacgc tttttt                                     375

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<210> 242
<211> 387
<212> DNA
<213> Homo sapien

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<400> 242
aaaggcattc tctgatttac atgagaattg agaaactgag atgtatgatt tgtctgttag      60
tcaatttcac accctttcat tctcataagc cccaaatttt gctcagttaa ggagcttgct      120
ttagggccac ctatgtaagt ctgttatact agctaattgtg cccatttgaa tagttcaagg      180
gtcagctaatt gctctgagct tcatggctcc agtataaaga acaaatttaa caaaattaag      240
ctgttactgt agccgagtta cccttctgct ccacacatat gtagtgggat cttgcaggat      300
ttccatagtg ccaattatca aaggccttga ctacttagca ttgctgtatt acagatgtgc      360
aaactgaggc actgaaaagt caaattt                                     387

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<210> 243
<211> 536
<212> DNA
<213> Homo sapien

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<220>
<221> misc_feature
<222> (1)...(536)
<223> n = A,T,C or G

```

```

<400> 243
aaacccaaag gacgaagaaa aaacactttt aaaaaaaaaa aaaaaaaaga aaaacccaaac      60
catattttgc cacatgtgag agtacggtca agcagtattt acaaaaagggt taacggaaca      120
acactctgac acatgctctg agaatactgg gactgctgtt tcaaaaaaaa aggttcaaac      180
ttattgtcac agcatcatca caaaatagag gatcaccatt ggtttgcttg gcttttcttt      240
ttttttttcc cccaagttag gacctaactc caaataatac aatagaatat gcaaattatc      300
ttcacatcaa gagtacccca agaaaaacga aatccatggc acanacactg tacaagggtg      360
cagggcaggg ctctgagggg cccaaacccc attttgcca ctcgattttc tagcattgaa      420
gggagcaagg ggtcaggcat atgatggaga tgatactgaa atgattttat caaaatccat      480
gcaaatcaag ttcttttgat agaggtgaan aacttggaca tggctgtttc aggcag      536

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<210> 244
<211> 397
<212> DNA
<213> Homo sapien

```

```

<400> 244
ccaggataat atacacaggt ttgcagctaa aactgtgcac agtgggtcat tgatgctagt      60
cacagtggaa ctgaaggaag gctctacagc ccagcttata ataaacactg agaaaactgt      120
gattggctct gttctgctgc gggaactgaa gcctgtcctg tctcaggggt aacctgctta      180
catctggact ttagaatctg gcacacaaca aaagtgcctg gcatccacta ctgctgcctt      240
tcatttataa taatagccct tccatctggc agtgggggaa gaatacactc ttgacattct      300
tgtctcctgc tttagaatgc tagtgtgtat ctatcatgta tgcaataact tccccctttt      360

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tgcttttgcta accaaagagc atatatttta ctgtcag

397

<210> 245

<211> 508

<212> DNA

<213> Homo sapien

<400> 245

cgaggagtcg	cttaagtgcg	aggacctcaa	agtgggacaa	tatatattgta	aagatccaaa	60
aataaatgac	gctacgcaag	aaccagttaa	ctgtacaaac	tacacagctc	atgtttcctg	120
ttttccagca	cccaacataa	cttctaagga	ttccagtggc	aatgaaacac	atcttactgg	180
gaacgaagtt	ggttttttca	agcccatatc	ttgccgaaat	gtaaatggct	attcctacaa	240
agtggcagtc	gcattgtctc	tttttcttgg	atgggtggga	gcagatcgat	tttaccttgg	300
ataccctgct	ttgggtttgt	taaagttttg	cactgtaggg	ttttgtggaa	ttgggagcct	360
aattgatttc	attcttattt	caatgcagat	tggtggacct	t.cagatggaa	gtagttacat	420
tatagattac	tatggaacca	gacttacaag	actgagtatt	actaatgaaa	catttagaaa	480
aacgcaatta	tatccataaa	tatttttt				508

<210> 246

<211> 358

<212> DNA

<213> Homo sapien

<400> 246

aaatgttgg	attcaaaacc	aaagatatata	ccgaaaggaa	aaacagatga	gacataaaat	60
gatttgcaag	atgggaaata	tagtagttta	tgaatgtaaa	ttaaattcca	gttataatag	120
tggctacaca	ctctcactac	acacacagac	cccacagtc	tatatgccac	aaacacattt	180
ccataacttg	aaaatgagta	ttttgcatat	ctcagttcag	gatatgtttt	ttacaagtta	240
atcctaaagt	cataaagcaa	gaagctattc	atagtacaag	attttatttg	ctaagcttta	300
caaattaaac	tctaaaaaat	tattacaatg	atactgaaag	atattttatt	ggcctttt	358

<210> 247

<211> 673

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(673)

<223> n = A,T,C or G

<400> 247

gaagaaagtt	agattttacgc	cgatgaatat	gatagtgaag	tggatttttg	cgtaggtttg	60
gtctaggggtg	tagcctgaga	ataggggaaa	tcagtgaatg	aagcctccta	tgatggcaaa	120
tacagctcct	attgatagga	catagtggaa	gtgagctaca	acgtagtacg	tgtcgtgtag	180
tacgatgtct	agtgatgagt	ttgctaatac	aatgccagtc	aggccaccta	cggtgaaaag	240
aaagatgaat	cctagggctc	agagcactgc	agcagatcat	ttcatattgc	ttccgtggag	300
tgtggcgagt	cagctaaata	ctttgacgcc	gggtggggata	gcgatgatta	tggtagcgga	360
ggtgaaatat	gctcgtgtgt	ctacgtctat	tcctactgta	aatatatggt	gtgctcacac	420
gataaacctt	aggaagccaa	ttgatatcat	agctcagacc	atacctatgt	atccaaatgg	480
ttcttttttt	ccggagtagt	aagttacaat	atgggagatt	attccgaagc	ctggttaggat	540
aagaatataa	acttcagggt	gaccgaaaaa	tcagaatagg	tggtgggtata	gaatggggct	600
tcctnctccg	cggggtcnaa	gaaggtggtg	ttgangttgc	cggnctgtta	ntagtatagn	660
gatgccanca	gct					673

<210> 248
<211> 149
<212> DNA
<213> Homo sapien

<400> 248
cctcttcatt gttcacatgt cacaggagga ggctctgagc aaaggccact ggcaagtttag 60
ggcaacacca agaaggctct gcggagagac tccctgtggg ttggggcctg gcaggaacgg 120
tgctgtgga ctgtttatgg tctgtccag 149

<210> 249
<211> 458
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(458)
<223> n = A,T,C or G

<400> 249
gaagctaaat ccaaagaaat atgaagggtgg ccgtgaatta agtgatttta ttagctatct 60
acaaagagaa gctacaaacc cccctgtaat tcaagaagaa aaaccaaga agaagaagaa 120
ggcacaggag gatctctaaa gcagtagcca aacaccactt tgtaaaagga ctcttccatc 180
agagatggga aaaccattgg ggaggagtag gacccatag ggaattatta cctctcaggg 240
ccgagaggac agaattggata taatctgaat cctgttaaat tttctctaaa ctgtttctta 300
gctgcactgt ttatggaaat accaggaeca gtttatgttt gtgggttttg gaaaaattat 360
ttgtgttggg ggaaatgttg tgggggtggg gttgagttgg gggtattttc taattttttt 420
tgtacatttg gaacagtgac aataaatgan accccttt 458

<210> 250
<211> 374
<212> DNA
<213> Homo sapien

<400> 250
aaaaaaciaa acaatgtaag taaaggatat ttctgaatct taaaattcat cccatgtgtg 60
atcataaact cataaaaaata attttaagat gccggaaaag gatactttga ttaataaaaa 120
acactcatgg atatgtaaaa actgtcaaga ttaaaattta atagtttcat ttatttgta 180
ttttatttgt aagaaatagt gatgaacaaa gatccctttt catactgata cctggttgta 240
tattatttga tgcaacagtt ttctgaaatg atatttcaaa ttgcatcaag aaattaaaat 300
catctatctg agtagtcaaa atacaagtaa aggagagcaa ataaacaaca tttggaaaaa 360
aaaaaaaaaa aaaa 374

<210> 251
<211> 356
<212> DNA
<213> Homo sapien

<400> 251
aaagatcttc tctaacaagc tatgggaatt tggttcata ctctttcttt gcaacagcag 60
tggtctgggt gataattttg aattgatacc tgttcctttt tctgggtttt gttggtttt 120
tgaaaaattg tctttcctta tcattgggtg gaggttggg agcaaagtaa catttttttg 180
aaaagaggac agaaaaattg aactacagct tgagaacgta ttcttttttt cctactttgt 240
tattgcaaat tgaggaatca cttttaactg ttttaggtgt gtgtgtccag agtgagcaag 300

gattatgttt ttggattgtc aaagaggatg cttagtctta aaataaaaaat aaattt 356

<210> 252
<211> 484
<212> DNA
<213> Homo sapien

<400> 252
ctggtaaact gtccaaaaca aggttccaaa taacacctct tactgattta ccctacccat 60
acatatccca aatagttttt gatcaaaaac atgaaataga tccacctgct tattttaagc 120
atattaaaaa ggaaactaat tggaccattt tctatttgtc tattttatac aaaaaggcta 180
cacaattgtt acactttatt cagattacaa ttaattagag tgattatgaa ttagtgttct 240
acaccattac tcaattctta aaaattagaa attgctgtag cagtattcac tataacttaa 300
cactacgaga gacttaaaaa acagttactg caaaaaaaaa aaagagctac ttcaaagcaa 360
gcaaagtcag taccattaca gatattctta aaaaaaaaaa aaaatttaac aagcaaggct 420
agggtttgat aaattccatc ttgtgatcca ttcttgatga ttcttcactt cttgagtcac 480
tccc 484

<210> 253
<211> 379
<212> DNA
<213> Homo sapien

<400> 253
aaaaagcgct tagacttccc ttcccatctg gaacatgtaa aattttgcag caacagggtt 60
tctccaattc cttcagcaag aattcccagc ctacacacaa atttaacacc atctttttct 120
attcatgtat aacttggatc acacaccagt atataacgac aaaagataaa tgtataataa 180
aaagattgga taaatcagaa gaggtttttt ggtcttgaat tcttcaccca ctaacaatga 240
agcagcactg taggcagccc aaaacacacc aaacagtttt ataagtgtag acaccacttc 300
aatgatcca accacaaaa gtacaggggc tattacaatg agaggaaagta atgaatatcc 360
tataactcca aggacttgg 379

<210> 254
<211> 387
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1) ... (387)
<223> n = A,T,C or G

<400> 254
aaatttgact ttccagtgcc tcagtttgca catctgtaat acagcaatgc taagtagtca 60
aggccnttga taattggcac tatggaaatc ctgcaagatc ccactacata tgtgtggagc 120
agaagggtaa ctgggtaca gtaacagctt aattttgtta aatttgttct ttatactgga 180
gccatgaagc tcagagcatt agctgaccct tgaactatcc aaatgggcac attagctagt 240
ataacagact tacataggtg ggcctaaagc aagctcctta actgagcaaa atttggggct 300
tatgagaatg aaagggtgtg aaattgacta acagacaaat catacatctc agtttctcaa 360
ttctcatgta aatcagagaa tgccctt 387

<210> 255
<211> 225
<212> DNA
<213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(225)
 <223> n = A,T,C or G

<400> 255
 aaatgtcttg tttccagat ttcaggaaan tttttttctt ttaagctatc cacagcttac 60
 agcacctttg ataaaatata cttttgtgaa caaaaattga gacattttaca ttttctccct 120
 atgtggcgcg tccagacttg ggaaactatt catgaatatt tatattgtat ggtaatatag 180
 ttattgcaca agttcaataa aaatctgctc tttgtatgac agaatt 225

<210> 256
 <211> 544
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(544)
 <223> n = A,T,C or G

<400> 256
 ccttgcttaa agcccagaag tgggttaggc ntttggaana tctgggtcac atcataaaga 60
 acttgatttg aaatgttttc tatagaaaca agtgctaagt gtaccgtatt atacttgatg 120
 ttggtcattt ctacgtccta tttctcagtt ctattatttt agaacctagt cagttcttta 180
 agattataac tggctctaca ttaaaataat gcttctcgat gtcagatttt acctgtttgc 240
 tgctgagaac atctctgcct aattttaccaa agccagacct tcagttcaac atgcttcctt 300
 agcttttcat agttgtctga catttccatg aaaacaaagg aaccaacttt gttttaacca 360
 aactttgttt gggttacagtt ttcaggggag cgtttcttcc atgacacaca gcaacatccc 420
 aaagaaataa acaagtgtga caaanaaaaa aacaaacctt aatgctactg ttccaaagag 480
 caacttgatg gtttttttta atactgagtg caaaaggnc aacaaatttc tatgatgaaa 540
 tttt 544

<210> 257
 <211> 420
 <212> DNA
 <213> Homo sapien

<400> 257
 aaatgtcttg tttccagat ttcaggaaac tttttttctt ttaagctatc cacagcttac 60
 agcaatttga taaaatatac ttttgtgaac aaaaattgag acattttacat tttctcccta 120
 tgtggcgcgt ccagacttgg gaaactattc atgaatattt atattgtatg gtaatatagt 180
 tattgcacaa gttcaataaa aatctgctct ttgtatgaca gaatacattt gaaaacattg 240
 gttatattac caagactttg actagaatgt cgtatttgag gatataaacc cataggtaat 300
 aaacccacag gtactacaaa caaagtctga agtcagcctt ggtttggcct cctagtgtca 360
 attaaacttc taaaagttta atctgagatt ccttataaaa acttcagca aagcaacttt 420

<210> 258
 <211> 736
 <212> DNA
 <213> Homo sapien

<400> 258
 aaacaaaatg ctaaacctaa aaacattggt ctgtcagttc ccaaattaaa tctacttaga 60

acaaaaacaa	aaatttatag	ctcggtcaca	tactacttaa	ataatattgt	tcaggcatct	120
ctaaaatcct	ccatgttttc	aagtatggaa	atagaactca	aatattccac	aatacagtac	180
taaacagatg	gagtatttag	gaaagacttt	gttgtcatat	ggcacaatat	taatattttg	240
ttgcttcaat	acgttttgaa	ataaatatca	gatttttggt	tttttttcct	aaaagaccaa	300
aattataatc	tacattaaga	taattctgac	tgtgggtaag	acttaagagt	gtaaaataca	360
acatcaatat	ttatcacaa	aagtaaaagct	ggtaacaaat	tataaaagga	gccagtactc	420
tactgagaca	ggctcggaga	ttaaagctca	tcatgataga	aatagtcata	atggagctgt	480
ctgccataat	ctgtggcttc	actggtgaga	aacaagtcg	ggttttccag	aatctcttct	540
tcagagagct	ttttgtcacc	attcaaatcc	atttcatcaa	ttagatgaag	cgcctcctct	600
tgtgcaatgc	cctgattatt	aggtctaccc	aaggtaacag	ctcttgggga	tcaagcctgc	660
catcgttatc	tttgtcataa	tcattcacccg	aatctgtctt	tctcacaagt	atcccattct	720
ggatcttcat	ttgcag					736

<210> 259

<211> 437

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(437)

<223> n = A,T,C or G

<400> 259

aaaaccatac	tgaaatcatt	taccaataa	cnaagatctt	aatctaaaag	atagtgaata	60
catcatcacc	atgaaatctg	gttttatgtg	ctctatgaag	tacttgaggaga	attgcttttt	120
tatttttctt	ttgctttatt	aggtcacaca	aaacagaatg	aattagcaga	aaaatgtatg	180
ttataaaaaca	gcatttacta	cttcaattta	atttttttta	ctaacaattg	tggacctttt	240
tgatgacact	tatgtatggt	tttaataaat	tatgtactta	ttagtactta	atgagccctt	300
cctgcctcaa	tataaaaatta	ctaaacttgg	agaattacag	attttattgt	aggccctgat	360
gttagtcact	ttggagaagc	taaaaatttg	gaaatgatgt	aattcccact	gtaatagcat	420
agggatatttg	gaagcag					437

<210> 260

<211> 592

<212> DNA

<213> Homo sapien

<400> 260

tttttttttt	gaaaaatata	aaattttaat	aaaggctaca	tctcttaatt	acaataatta	60
ttgtaccaag	taattttcct	taaatagaact	ctttataatg	cataatttac	agtataagta	120
gaacaaaatg	tcatgacaaa	agtcattgag	tacaagactt	gtaataaaaa	ggcataaaat	180
atattttatac	ataaacccct	ttcaaaaaac	aagggaagc	ttgagccctc	aatatagggc	240
gacacacgga	gcgggtgacc	gtgcaggtag	aggtactgta	ctgatttaaa	gtcaagcact	300
agagatagtg	gattaatact	cttttgccgt	acactatata	cagatgtata	gtacaagtaa	360
caatggcaaa	cagaatgtac	agattaactt	aacacaaaaa	cccgaacatc	aaaatgaagg	420
tgtgtggagg	aaaggtgctg	ctgggtctcc	ctacaactgt	tcatttcttt	gtggggcagg	480
gggtagtctc	tgaatggctg	tgggtccaatg	actaatgtaa	aacaaaaaca	gaaacaaaaa	540
aaacaaggaa	ctgtcatttc	cacgaaagca	cagcggcagt	gattctagca	gg	592

<210> 261

<211> 450

<212> DNA

<213> Homo sapien

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<400> 261
gtggcagggc ccagccccga accagacaag ggacccctca aggagcttca ttctagcatg      60
agaaaattga gaagtaaacc agaaagtac agaatgtctg aaggggacag tgtgggagaa      120
tccgtccatg ggaaaccttc ggtggtgtac agatttttca caagacttgg acagatttat      180
cagtcctggc tagacaagtc cacaccctac acggctgtgc gatgggtcgt gacactgggc      240
ctgagctttg tctacatgat tcgagtttac ctgctgcagg gttggtacat tgtgacctat      300
gccttgggga tctaccatct aaatcttttc atagcttttc tttctcccaa agtggatcct      360
tccttaatgg aagactcaga tgacggtcct tcgctacca ccaaacagaa cgaggaattc      420
cgccccctta ttcgaaggct cccagagttt      450

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<210> 262

<211> 239

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(239)

<223> n = A,T,C or G

```

<400> 262
taactttgat gacaaaaatct aaaattaaag anttagtctt aaaagcctat agtgacttgt      60
ttacttgcac aaataaattt ttcacttagt acaggctatt aatataagta atgagaattt      120
aagtattaac tcaaaaaaag atagaggctc caaacttttc taagaaatta atgcattttc      180
aaagtaataa tataatcaat ctgttagtca aaagtaattt catattcatt gccaaattt      239

```

<210> 263

<211> 376

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(376)

<223> n = A,T,C or G

```

<400> 263
aaaaaaaaaa aaaaaaaatt ccttgtngtt tnttagagga aaaaaagaaa aaccccaact      60
tttancactg atactacata ttgctctgtt aaagaatttt ctctgccaaa aaaaagaaaa      120
aacaaaaaaa cgcttaaagc tggagtttga cattctgctt tcagatgctg tctttttatt      180
agtgagtgat gatggtttgc taataatcaa taggtaataa ttttttgtaa tcccatcaag      240
tggctccata tgtttctgct ctctcgtgac tgtgttaatg ttttaactgt gtaccttaaa      300
gccgaaatca gtaactatgc atactgtaac caaggatttg ggcttacaga gttgtttgtt      360
gnataaagaa aattttt      376

```

<210> 264

<211> 207

<212> DNA

<213> Homo sapien

```

<400> 264
aaattagcat tccacaaata tacaggtaat ttaataatta ttgtgcatga atacatacac      60
aatgcttata tatacaaatt ccagtttggt ttcattgtgt ggcaagggat ttgtatacaa      120
tcataagctg tgttcatatt ggtccatttg aatattcaca atacaaaagc acaaaagaac      180
cattgattta caaaaggaaa tctattt      207

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<210> 265
 <211> 388
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(388)
 <223> n = A,T,C or G

<400> 265
 naactgcact ttatttggtta ctgtaacatt nttttttaac tgatcaacca taagcatgca 60
 aaagnccnct gaaactgctt ccaactgcctg ttgtatagaa atgggtaaata tataaagggtg 120
 attcaatttg gagctccttc cttttttata gcacttctaa gctgtgtgctg cgacacacac 180
 cacagaggta ggaaggacca cttttaataa attatcttct taatcgcaga gaatttctga 240
 agataaaaact gacaaaatgc taaaccaagg ctttgatgag tcccaaagga ccacagatcc 300
 atcggctcct atttgaagaa ttcacccct gtagtggtct agcctttgta gggcactgga 360
 ttacaagatc caccagggtc ctgaacaa 388

<210> 266
 <211> 616
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(616)
 <223> n = A,T,C or G

<400> 266
 aaatacagag tcaaaagatg atttataaaa tntaaaacat tttctgcttg gcggtatttg 60
 aagacaagct gaatacatat ctatgttctg aataagtcca ctatggatat atataaggaag 120
 agatatacat atatccatcc acagatacac acacacatat atatttctgc atgtatatat 180
 acataattct ttctatagtt acaggaaata cttcttctat aattctgatt ttgactccca 240
 tcctccacca ttactcatc cactcattac ctaaaatcttg gctttcttct ctatattgta 300
 aataatccat ccaaacttct agccagtaact gtcaggagggt ttcttgctcg agtgagctgt 360
 taatactatt ttccactgac aacttctgca catcgaggac acagtgtatc tgaagactcc 420
 gctgtatact tccaacaacg ggggcatttt tctttcgtag tcggcatgac aattacttta 480
 taggaagact cttcacgaat atcaccacct tctaagttga tgaggaattt ccctttaagc 540
 tcgattacat ctgcagtcac ctctcgtggt tcctgaccag taaagttgac tcagaagcca 600
 tcattaattc attcaa 616

<210> 267
 <211> 341
 <212> DNA
 <213> Homo sapien

<400> 267
 ccattatgta tgtattttct tgaaaaatac ttatttcagc tacttatttt taatagttac 60
 ttattcttgt tgtattgtca tttgagtttt gtatatattt ttgatattaa ccccttgta 120
 catgtataat ttgcaaatac tttctccctt tttttagttg tcacattctg ttcattgtat 180
 cagattctgt gcagcagctt ttttaattga agtgatctga ctgacttggt cttccttttg 240
 tgtcctggga ttttaggtt aaatcaaaaa acttgctgcc cagaccaatg ttatggggct 300
 ttcactctat tttttggtag tagtagttta agagtttttag g 341

<210> 268
 <211> 367
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(367)
 <223> n = A,T,C or G

<400> 268
 ttgtagattg gaatagcaaa agtgaatgct ntgaccaaaa tttttgccct cctaaataaa 60
 gacgtntcct tctagagagc aaatctatca taaaatgtca aaactagaag agaataaaat 120
 gaaaggaaaa aacctagaaa aatatcctaa aatatcaaat gcagtcattt ctaaataataa 180
 gccataatta tagctttacc tattgttctt attgttccta tgctgcttct acaatgttac 240
 atcaactata cttagcttta ctctcccaaa atcttgggtga tgaagccttc tgagtgtgct 300
 ttccaargtg ccagaaccag aagggcattc caaggcttcc ccacatttcc tccatttacg 360
 gagacag 367

<210> 269
 <211> 270
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(270)
 <223> n = A,T,C or G

<400> 269
 caaatctctc cctcactaga cgtaagccnt ttntcactc tctcaatctt atgcatcata 60
 gnaangengn tgagggtgat taaaccaaac ccagctacgc aaaatcttag catactctc 120
 aattaccac ataggatgaa taatagcagt tctaccgtac aaccctaaca taaccattct 180
 taatttaact atttatatta tcctaactac taccgcatcc ctactactca acttaaactc 240
 cagcaccacg accctactac tatntcgac 270

<210> 270
 <211> 368
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(368)
 <223> n = A,T,C or G

<400> 270
 ctgaatcatg aataacacta tataatagag tntaaggaa acaagcatta gatgtgatcc 60
 ttgccccata cccttagatt atgtcagact aaagctgaca attctgccag gctctgaacc 120
 cctagtgcc ccaacccaaa tcttggaagc aaagaatatg ccctgtcata caactttgta 180
 caagttgtag taaaacaaag cttaagtttt ctcatctttc tacagcaa at ggtcagttat 240
 ttaataaaca ctaaaatgct cctaagaatc cattttgagt ttgtttacca aacacattgt 300
 gcaagaactg actacacaaa aagttccttt gaaatttggc ccacaaattc acttaagggt 360
 ggaaattt 368

<210> 271
 <211> 313
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(313)
 <223> n = A,T,C or G

<400> 271
 aaatttatat aaaactctgt acatgttcac tttattattg cataaacagc ataattcttca 60
 agacaanngt ttgcaaacac atgtccaatt caggaaaaaa aatttcacgt ttctcgtctg 120
 gcttttttct tcttttttat ttgtttggga gattcccagc tagtttcaga ctgtggtctgt 180
 gaaggaggca cactattttg cttggtattt gacttggatt tatctgtctc ttgtagtatt 240
 ggcggcactt gggaagagct cttgtcagaa tcactttttg ataagattac agatgggtcg 300
 gtgaagtag cag 313

<210> 272
 <211> 462
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(462)
 <223> n = A,T,C or G

<400> 272
 aaaaaacatt tattttaata agactattgc naacacatta aaaaaactaa atagtaatat 60
 tacaaaaatct atatacttgc acatttagta ttgtcaatg tgccagaggt ttcttctcatg 120
 aaatttgact tctttgaagt gaaggctttt ttctatcatc tcttatagct ctgactgaat 180
 aagtcttaat gctttcttca tgttttctat caataggggt aaatcccag gctcatatgt 240
 gtacaatctg ttagagtatc ttccagctat gtcagctcta actgttaaag aagggtctac 300
 aaacatgatt ctaggcacat attgcccac aggtgataaa ttcttatcag tggtttcatg 360
 cataaggttt agcatgatga acttattctg agccatttct tgtatttctt cattttgggc 420
 aaatactttc tttagtgtt gagagtattg acaatcctcc ag 462

<210> 273
 <211> 282
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(282)
 <223> n = A,T,C or G

<400> 273
 ctgatcaaag catgggatat tttaatagtn ttatacataa tattttttaca tagaaaactt 60
 tacatnncat ttcatttat ataatcttgc ttattctttc aaaaatttat acatccattg 120
 ggcaagggaat ggttttcatt aaattaccaa tattaatgc acttaatcat tgtgtatagg 180
 ttaaaccaaa gtaactatta actaactttt aggcatttta aggaggtaaa acatacattt 240
 tacacataag tatttgatgc aaatatgcag ataaaatttt tt 282

<210> 274
 <211> 125
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(125)
 <223> n = A,T,C or G

<400> 274
 cagccctaga cctcaactac ctaaccaacn ttnccttaaaa taaaatcccc actatgcaca 60
 ttnaatcnct ccaacatact cggattctac cctagcatca cacaccgcac aatccccctat 120
 ctagg 125

<210> 275
 <211> 528
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(528)
 <223> n = A,T,C or G

<400> 275
 aaagctgtgg aaaagcttta ttatagattt ttntacagaa taaaaaaagt tcaaacaata 60
 ataagccngg aaccacaaat aattaaaagg aaacacagca atcccataaa caagcattct 120
 ggcattctgtt agaaattttc cctcaaatta tgaaatgtag ctctccatgc tttccaatga 180
 ttgttataat acccacaat atctgtgatt tcagtggaaat actttaacaa aagttttctt 240
 tttaaaggcat gattcctgatt ctttttttct tcaatatctc agtcatttca ggaactacct 300
 taaataaatac tgcaactatt ccataatctg ccacttgga aattggagct tctgggtctt 360
 tattaattgc cacaattgtc ttgctgtctt tcacccagc taaatgttgg atggctccag 420
 atattccaac agcaatataa agttctggtg ctactatttt tcccgtctgn ccaacttgca 480
 tgtcattggg aacaaagcca gcatcaacag cagcacggga agcaccaa 528

<210> 276
 <211> 420
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(420)
 <223> n = A,T,C or G

<400> 276
 aaatgtcttg tttcccagat ttcaggaaan tttttttctt ttaagctatc cacagcttac 60
 agaaacctga taaaatatac ttttgtgaac aaaaattgag acattttacat tttctcccta 120
 tgtggtcgct ccagacttg gaaactattc atgaatattt atattgtatg gtaatatagt 180
 tattgcacaa gttcaataaa aatctgctct ttgtatgaca gaatacattt gaaaacattg 240
 gttatattac caagactttg actagaatgt cgtattttgag gatataaacc cataggtaat 300
 aaaccacag gtactacaaa caaagtctga agtcagcctt ggtttggtt cctagtgtca 360
 attaaacttc taaaagttaa atctgagatt ccttataaaa acttccagca aagcaacttt 420

<210> 277
<211> 668
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(668)
<223> n = A,T,C or G

<400> 277
ccagggtggc tctgatatag cagccctggt ntattttcga tatttcagga agactggcag 60
atngcaccag accctgaatt cttctagctc ctccaatccc attttatccc atggaaccac 120
taaaaacaag gtctgctctg ctectgaagc cctatatgct ggagatggac aactcaatga 180
aaatttaaag ggaaaaccct caggcctgag gtgtgtgcca ctcagagact tcacctaaact 240
agagacaggc aaactgcaaa ccatggtgag aaattgacga cttcacacta tggacagctt 300
ttcccaagat gtcaaaacaa gactcctcat catgataagg ctcttaccct cttttaattt 360
gtccttgctt atgcctgcct ctttcgcttg gcaggatgat gctgtcatta gtatttcaca 420
agaagtagct tcagagggta acttaacaga gtatcagatc tatcttgta atcccaacgt 480
tttacataaa ataagagatc ctttagtgca ccagtgact gacattagca gcattcttaa 540
cacagccgtg tgttcaaag tacagnggtc cttttcagag ttggacttct agactcacct 600
gttctcactc cctgttttaa ttcaaccag ccatgcaatg ccaaataata gaaattgctc 660
cctaccag 668

<210> 278
<211> 202
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(202)
<223> n = A,T,C or G

<400> 278
aaattggat cgacggcaac caggggaagn tnctaaactc ctaatctatt ctggatccaa 60
ttngcnaagt ggggtcccat caaggttcag tggcagtggg tctgggacag atttcactct 120
cacgatcagc agtctgcaac ccgaagattt tgcaacttac tactgtcaac agagttacat 180
gtccccgtac acttttggac cc 202

<210> 279
<211> 694
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(694)
<223> n = A,T,C or G

<400> 279
ctgtacttgg acaaaataag ttaattctat ttggttgctc attaaagttt tatgtggcta 60
tgnaccact ggagctaaaa attggctttt aactgtttcc aaatcagaac tagcagagga 120
gagaagtaaa taaagccaat ggcactccct tcagaggctc aaaatggta gattttgatg 180

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cagatttaac cttagcgagt ttcagtcagt ccatttagat gatcctgtag gttcatacaa 240
atacactgaa ccgttggttt aacttctctt ccttctctcaa agtttatgat aaagagactc 300
atccctgtat tgggagtgac tgacataagt tcagatctgc tcagagtggc tggtaaggaa 360
cacttaaggt cagtcagaaa ataatacaaac agacttctca tgaagcacc gtgactcaca 420
actaagacac tggctgctaa tcctggaata ccgctgtctg aattaacttt agagctgtga 480
tttttctcta aaggaaatat ctctgccaaa gaagtttcca gacagntgct tgggagatcc 540
ttggggaaaa ctggtctttt tgatccggtt ctttcangan taggtngaca aaagaaatnc 600
aaaaaagntc atcccacgcn tttntcacct gggcccagcg gnnctcctcc nggggggggn 660
aaacacangg gactcttccc ngggctngct tnnng 694

```

<210> 280

<211> 441

<212> DNA

<213> Homo sapien

<400> 280

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aaaaaacttc catgcaactt ctggtttatt gtttggcaac tccacatgat aaaaaaataa 60
aaacagccca accgagtttc ggaattaagt attcttctag taagtgatcc aaacttgtaa 120
tatttgccac aggactgact tatttattta ctagctagaa gctcttaagt tcacttgttt 180
atcagggcat atacagaagg gtttgtaaaa actcgaatgt aactttacaa ctttctgacc 240
tgggtgcatga attctcaagt actgtatttc actgtgttgg tgtgtctgat ggaaatttcg 300
aggtgggtccc acaaaaatat tttatgtagt gtgccttcaa agagaaccat ttatttctct 360
tcacttatcg tcccacaaag tcacatttgg tggtygtcag ccaagtcgca tctgggtctag 420
ttttactctt gtcccaattt t 441

```

<210> 281

<211> 398

<212> DNA

<213> Homo sapien

<400> 281

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aaatttggtta ggtctgaaga atctaaaact gttaatttaa cccttaactt gtgcctagaa 60
actacagcac atataaaata tgtaaacacc agcctgttgc tgtacttttc tgcttatttt 120
acagcctcaa atatttctca ttatcttgtc acttagttct tcatgtttct ctttctgact 180
tttaataatg gtaataggaa aacaaaaccc aaagcttttc agaacttcag tgtgaggttt 240
cctattttga caagttaact tgtaaaatact caggttttac gatgtataat ttacctaata 300
gaccaaacta actcatggag atattttgaa ctattattta ggtacaaaact ttataaagaa 360
tgtagtatg tcataaaata taacattaca gcttattt 398

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<210> 282

<211> 226

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (226)

<223> n = A,T,C or G

<400> 282

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aaaacaatat tctctttttg aaaatagtat naacaggcca tgcatataat gtacagtgtg 60
ttacnccaat atgtaaagat tcttcaaggt aacaagggtt tgggttttga aataaacatc 120
tggatcttat agaccgttca tacaatgggt ttagcaagtt catagtaaga caaacaagtc 180
ctatcttttt ttttggctgg ggtgggggag cccaggccga ggctgg 226

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<210> 283
 <211> 358
 <212> DNA
 <213> Homo sapien

<400> 283
 aaacaaaaat actcaagatc atttatatatt ttttggagag aaaactgtcc taatttagaa 60
 tttccctcaa atctgaggga cttttaagaa atgctaacag atttttctgg aggaaattta 120
 gacaaaacaa tgtcatttag tagaatattt cagtatttaa gtggaatttc agtatactgt 180
 actatccttt ataagtcatt aaaataatgt ttcatcaaat ggtaaattgg accactgggt 240
 tcttagagaa atgttttttag gcttaattca ttcaattgtc aagtacactt agtcttaata 300
 cactcaggtt tgaacagatt attctgaata ttaaaattta atccattctt aatatttt 358

<210> 284
 <211> 288
 <212> DNA
 <213> Homo sapien

<400> 284
 aaaacttttg ttaagaaaaa ctgccagttt gtgcttttga aatgtctgtt ttgacatcat 60
 agtctagtaa aattttgaca gtgcatatgt actgttacta aaagctttat atgaaattat 120
 taatgtgaag tttttcattt ataattcaag gaaggatttc ctgaaaacat ttcaagggat 180
 ttatgtctac atatttgtgt gtgtgtgtgt gtatatatat gtaatatgca tacacagatg 240
 catatgtgta tatataatga aatttatgtt gctgggtatt tgcatttt 288

<210> 285
 <211> 629
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(629)
 <223> n = A,T,C or G

<400> 285
 cctaaaagca gccaccaatt aacaaagcgt ncanntcaa caccactac ctaaaaaatc 60
 ccaaacatat aactgaactc ctcacacca attggacca tctatcacc tatanaagaa 120
 ctaatgttag tataagtaac atgaaaacat tctcctctgc ataagcctgc gtcagattaa 180
 aacactgaac tgacaattaa cagcccaata tctacaatca accaacaagt cattattacc 240
 ctactgtca acccaacaca ggcatgtca taaggaaagg ttaaaaaaag taaaagggaac 300
 tcggcaaadc ttaccccgcc tgtttaccaa aaacatcacc tctagcatca ccagtattag 360
 aggcaccgcc tgcccagtga cacatgttta acggccgagg taccctaacc gtgcaaagggt 420
 agcataatca cttgntcctt aattagggac ctgtatgaat ggcttcacga gggttcagct 480
 gtctcttact ttttaaccagt gaaattgacc tgcccgtgaa gaggcnggca tgacacagca 540
 agacgagaag accctatgga gctttaattt attaatgcaa acagnaccta acaaacccca 600
 caggtcctaa acttacccaa accctggca 629

<210> 286
 <211> 485
 <212> DNA
 <213> Homo sapien

<400> 286
 aaatgtactt gctcagctca actgcatttc agttgtatta tagtccagtt cttatcaaca 60

ttaaaaccta	tagcaatcat	ttcaaactta	ttctgcaa	tgtataagaa	taaagttaga	120
attaacaatt	ttattttgta	caacagtgg	atcttctgtc	atggataatg	tgcttgagtc	180
cctataatct	atagacatgt	gatagcaaaa	gaaacaaaca	aaagccagga	aaacactcat	240
tttcgccttg	aatatgtaaa	tgggattaat	tttgtcctgt	gccttatgtg	gaaaggaact	300
tctttgggtt	tccttttttg	ttctggtgga	agcatgtgca	ggagacatat	catccaaaca	360
taaaccatta	aaatgtttgt	ggtttgcttg	gctgtaattt	tcaaagtagt	taattgagga	420
caaagggtaa	tgcagaagtg	atagctttgg	tttgctgagt	cttgttttta	gtggccttga	480
tattt						485

<210> 287
 <211> 340
 <212> DNA
 <213> Homo sapien

<400> 287						
cctggagtcc	aataaccacc	ccctcatacc	acaccctgtg	catacaccag	ccaagccttt	60
cctgggtctg	gaagggaaga	gaaaaaagac	gcaggeccacc	tgggggttct	gcagtctttg	120
gtcagtcacg	ccttctatct	tagctgcctt	tggcttccgc	agtgtaaacc	ttgcctgccc	180
ggaggcagga	ggcccagctg	gacctccgag	ggccatgagc	aggcagcagc	catcttgggc	240
tcaagcttgc	ctttcccttg	agtcctctc	tcccctcggc	tctagccaga	ggtgtagcct	300
gcagatctag	gaagagaaga	gctggggagg	aggatgaagg			340

<210> 288
 <211> 290
 <212> DNA
 <213> Homo sapien

<400> 288						
aaacagtctc	tctcgggtgt	tctccttgtc	aaactgttca	tcccagtttc	ctctgaaata	60
gacagcattc	accagaacca	gccttgctca	tggatccact	gagcccggag	agagcaactc	120
cgcaatttta	ctttctgtct	tttcagctac	ccaggtgttt	atgtgttttc	tggacttctc	180
tacggcgctg	ataaagtcaa	gctcctccat	ctctgcttgg	tagaattttt	ggcaggaatc	240
tctaaaagat	gagaggaaat	cacaagactt	ttccccaaag	agcctgttgg		290

<210> 289
 <211> 404
 <212> DNA
 <213> Homo sapien

<400> 289						
ccaccacgc	ttaggttccc	atcacactga	tgactccggg	tttggcgagc	acaggagcgc	60
aaaccttttc	acattctttc	tgtgatccaa	atttggtttc	gtttccacca	caacctccat	120
accagaatct	tgcacagctt	ttggtgtttg	gatcatagta	ccattttaat	atgaaatccc	180
tgcaagtcc	ttcgtctttc	ggcaacttgc	atatatctgt	ttcagtgaga	gccaatgggt	240
ctgtgctcac	cattagattg	atggttgaac	tagaagctga	ccttgctggc	tgtggagggtg	300
ggggctgaga	tttctttgta	ctgaaacttc	cgtggttagt	ggctctgacc	tgagacctca	360
ggtagcagac	cacagccaca	tggtatgtct	gcccagcgag	cagg		404

<210> 290
 <211> 384
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature

<222> (1) ... (384)

<223> n = A,T,C or G

<400> 290

ccaggcgctc	cttgtcggca	tcagggaggg	tggccttgaa	ctgctcatgg	gctgtgggtca	60
gtccctggat	ctcctcaatg	gtgtgcacaa	tgaagggtgc	ctgcagggtcc	tccatggccc	120
cctccatcca	gttggtgaag	ggtgcagccc	gcttggcata	ctccaagtac	agctgggtcaa	180
tgggtctccag	cagtttctcg	gtccgctcca	gagcttccct	tcgcttctga	gttagggccc	240
ccagattgtc	ccactgggtca	cagatctttt	ggcaacgggc	gttgacactg	ggtgagtcac	300
aatantccag	ctcattgagc	tctgtgcga	tggcggcaat	ctgctccaca	cggctcctgg	360
gggcagccag	gccactctcg	aagg				384

<210> 291

<211> 278

<212> DNA

<213> Homo sapien

<400> 291

aaagtttatt	tttactat	ctttatcact	ttattgtatc	atcaccattg	gtttcataat	60
gtaaatacta	tatgttgaac	aaattaaatg	tcaaaat	ttattaccat	agtccatgtt	120
aatagtgggg	ctttcaggtg	tttagagatt	ttttttgttg	ttgttaacat	tcattgcaaa	180
agtactagat	ggtgtataac	tctagagttg	aattttaagg	gattccctaa	tatgtatact	240
atctttttat	ctgaagtaat	aaataaacaa	tgatcttg			278

<210> 292

<211> 177

<212> DNA

<213> Homo sapien

<400> 292

ccttggtccc	gtcattcttg	tccagtttga	taggttcag	aaattcgttg	tacagctcca	60
cctcgtttc	ctgcttaagt	gcattccgtg	caatcgtctg	gaacgcctgc	tccacgttga	120
tggcctcctt	ggcactgggtc	tcaaagtagg	gaatgttggt	tttgctgtag	caccagg	177

<210> 293

<211> 403

<212> DNA

<213> Homo sapien

<400> 293

aaaaagaagg	acttaggggtg	tcgttttcac	atatgacaat	gttgcat	ttatgatgcagtt	60
tcaagtacca	aaacggttgaa	ttgatgatgc	agttttcata	tatcgagatg	ttcgctcgtg	120
cagtactgtt	ggttaaatga	caatttatgt	ggattttgca	tgtaatacac	agtgcagacac	180
agtaatttta	tctaaattac	agtgcagttt	agttaatcta	ttaatactga	ctcagtgctct	240
gcctttaaat	ataaatgata	tggtgaaaac	ttaaggaagc	aaatgctaca	tatatgcaat	300
ataaaatagt	aatgtgatgc	tgatgctgtt	aaccaaaagg	cagaataaat	aagcaaaatg	360
ccaaaagggg	tcttaattga	aatgaaaatt	taattttgtt	ttt		403

<210> 294

<211> 305

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(305)

<223> n = A,T,C or G

<400> 294

aaagcaatct ggcattggtgt cctgtagtga agcagaggat cataacataa gtaaactctc	60
tatgggtgga agttggagag aaggacattt tggctttgta catgaaaaga ctctccagat	120
agaaacagat tctgcccata agtgaaataa aatgctttgt gggggtaatg agtgacttat	180
agtattcagg cagatgttac ataactgcta attaagtttc cctggattga ntttanncaa	240
anaattgaaa gtngattttg gtcangtgtc agnaaactac tgcctataaa cccatattct	300
accca	305

<210> 295

<211> 397

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(397)

<223> n = A,T,C or G

<400> 295

cctatctggt tggccttttt gaagacacca acctgtgtgc tatccatgcc aaacgtgtaa	60
caattatgcc aaaagacatc cagctagcac gccgcatacg tggagaacgt gcttaagaat	120
ccactatgat gggaaacatt tcattcccaa aaaaaaaaaa aaaaaaaaaa tttctcttctt	180
cctgttattg gtagttctga acgttagata ttttttttcc atgggggtcaa aaggtagcta	240
agtatatgat tgccgagtgg aaaaataggg gacagaaatc aggtattggc agtttttcca	300
tttncatttg tgggngaatt tttaatataa atgcggagac gtaaagcatt aatgcnagtt	360
aaaatgtttc agtgaacaag tttcagcggt tcaactt	397

<210> 296

<211> 447

<212> DNA

<213> Homo sapien

<400> 296

ccatcctcga tgttgaagtt gtcgtggggc ccgaagacgt tgggtggggat gacagcgggtg	60
aaggtagcgc cgtactgctg gaagtaggcc ctgttctgca cgtcgatcat cctcttggca	120
tacgagtacc caaaattgct gttgtgggga ggcccattgt ggatcatggt ctcatctatc	180
gggtaggctg tcttgtcagg gaagatacag gtggacaggc aggacaccac cttgcgggcg	240
cccacctcga aggccgagtg caggacgttg tcgttcattg gcacgttttt cctccagaag	300
tccaaattgt atttgatatt ccggaacagg cccccacca ttgcagcaag atggatgacg	360
tgtgtgagtt ggaccttctc aaacagggcg cgggtctgtg ctgtatccgt gagatcggcg	420
tcttttagagg agacaaacac ccagtc	447

<210> 297

<211> 681

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(681)

<223> n = A,T,C or G

<400> 297

aaataacagc	atgtaaaata	ttaaaataca	agctttcaaa	aataaataca	taaataagta	60
gaaccctcgt	aagaaatagt	caaacacatt	aagtcctttc	cagctgtccc	tagaaagctg	120
ctgttctctt	tttcattttc	agctctggta	agggcagggg	ccaccctgca	ggaagtgtca	180
atgatacgct	gataagcttc	ttacttctct	cctgtcagtt	gggtgctccc	ctgtgatgag	240
aaaaggggta	ctgttgacag	tgctaaggaa	ggctgctctt	ctgtcactct	gaagttgctt	300
ggaggggatgt	ccccatgcag	actctctccc	agccctccac	tcaggggaagg	tctgtctgta	360
cccactgcct	tctatagcag	aaaacttgca	ctcctgaatg	cttttttttt	ttttcaagaa	420
agaagnggct	gnggactcaa	ctagattctt	ggtttgaaaa	agccaaaaca	tattgggtcac	480
tgattgtcac	attgggttag	aatgtccat	tcatgatctc	ccttaagctg	cacacaaccc	540
tatgaaataa	ctaccattat	ctaccctatt	ttgctaaagc	tcaaagagat	taaataatgt	600
tgacagggat	cttagccttg	aactcactga	aggngttact	gcaaagttct	gctcttcacc	660
aagaaggnlt	acaggccaaa	g				681

<210> 298

<211> 353

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(353)

<223> n = A,T,C or G

<400> 296

cctggcttaa	gaccagacat	ttgaagaagg	ctccaggcag	ggaaaggaaa	ggagaggcca	60
gccccacnct	gnccctccc	tgccccacg	tctccagcaa	cacaaggcgg	ccagtggacc	120
gtgaaccatt	tattttccaa	ctataaagaa	acctgctctc	tgagaaaana	cactgcccag	180
gngatgaagc	tccagccctt	ggaggtccaa	aaccagctcc	aaactcagtc	ccttttagaaa	240
gctgctgtgc	cttggaatg	annntcggnt	gtcanagcct	gggaagtggg	gggaagaacc	300
agcccaactcc	cctctcctgc	tgcgattcca	gcgcncgttg	ggncagatc	tgg	353

<210> 299

<211> 560

<212> DNA

<213> Homo sapien

<400> 299

aaagttcaag	gactaacctt	atattatttg	gaaaggggag	gaggaaggaa	atgatatggg	60
accagacac	tgggctaggc	tgcaacttta	tctcatttaa	tactcccagc	tgtcatgtga	120
gaaagaaagc	aggctaggca	tgtgaaatca	ctttcatgga	ttattaatgg	atttaagagg	180
gcatcaatca	gctcaactca	agatttcata	atcattttta	gtatttagat	tgtgcctcaa	240
agttgtagta	cctcacataa	cctccactgg	tttctgtgtg	taaaaacctt	cagtgaagttt	300
gaccattgtg	ctcttggtct	ttgggctgga	gtaccgtggg	gagggagtaa	acactagaag	360
tcttttagtac	aaaactgctc	tagggacacc	tggtgattcc	tacacaagtg	atgtttatat	420
ttctcataaa	gagcttctcc	tatcccaagg	tcttcatgat	gccagtagcc	atatatgata	480
aattatgttc	agtataact	tagttatcag	aatcagctc	agtggctctc	cccgccatga	540
ttcacatttg	atgagttttt					560

<210> 300

<211> 165

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature
 <222> (1)...(165)
 <223> n = A,T,C or G

<400> 300
 aaaactaca taggggtgtg tgtgtgtgtg tatgtttatt ttatacacac atatttgtat 60
 attctaatat attactaagg caattttaat gaattaccat gtatataaaa aaatatctgn 120
 cacttggcac acaggtttgt atgtatgtgt atatatatat gtatg 165

<210> 301
 <211> 438
 <212> DNA
 <213> Homo sapien

<400> 301
 aaaatatatg tatttaaaaa caaaaagcaa cagtaatcta tgtgtttctg taacaaattg 60
 ggatctgtct tggcattaaa ccacatcatg gaccaaagt gccatactaa tgatgagcat 120
 ttagcacaat ttgagactga aatttagtac actatgttct aggtcagtct aacagtttgc 180
 ctgctgtatt tatagtaacc attttccttt ggactgttca agcaaaaaag gtaactaact 240
 gcttcattct cttttgcgct tatttgaaa ttttagttat agtgtttaac tggcatggat 300
 taatagagtt ggagttttat ttttaagaaa aattcacaag ctaacttcca ctaatccatt 360
 atcctttatt ttattgaaat gtataattaa cttaactgaa gaaaagggtc ttcttgggag 420
 tatgttgtca taacattt 438

<210> 302
 <211> 172
 <212> DNA
 <213> Homo sapien

<400> 302
 ccaaaacagg agtctcgggt gatatcatca tgagaccag ctgtgctcct ggatgggttt 60
 accacaagtc caattgctat ggttacttca ggaagctgag gaactgggtc gatgccgagc 120
 tcgagtgtca gtcttacgga aacggagccc acctggcatc tctctgagt tt 172

<210> 303
 <211> 552
 <212> DNA
 <213> Homo sapien

<400> 303
 ccagcctggt gcaggctgct tcgtagcggg cgtcggctgc ggacttccct tcccgggtct 60
 ggatcttttc atctaccag atgagaaagg gaatgagtga atggagtga cccgcaccct 120
 gtcactttcc tgagacatga ctgccaggaa gaagagctgc tctgggtctc atcagggctg 180
 gcaggacaaa ctgaccagtg agtcagtagg cagagttcac actgaaaaag ggcacaaggg 240
 ctgtcccaca atgggaggaa atgggtctc agaacttcta cttctctgaa aactaagaca 300
 caattgggac aaccaccacc cccgtgtgag atttctcacc tcgagacagg acaagatgaa 360
 gtacacggct tcttctgggg taaagacctt gaagagcca tcacaggcca acaaaatgaa 420
 cctacaacac caggagagaaa tataaacggg ttttaggcc aacaaaaaaa taaaaaataa 480
 aaaaagggcc tggagatgga gataaaataa atatttgtcc aactattcaa aggctaagg 540
 ttttttttct tt 552

<210> 304
 <211> 601
 <212> DNA
 <213> Homo sapien

<400> 304

cctttgattc ttggtagtag attgcatgta aaatgtttat aagaagctac ttttccttca	60
tgggaagaaa ttcccacatg agattcataa attcttagac tccgtggctt ctttgggtccg	120
gaatgcttaa actcatatga gtgttctgga tcccagtgtg tccaatcata attcacatta	180
tcaccttcac gaaccacata ctttgcccac ggtgaaatac gatacaagat ctctccgctt	240
ttactagtaa taactacctt taatttggat ccatgaggca cgagtacaga tttattctgc	300
tttgggtggga tatacagctc ccattttcca taatccagtt ttttgtatgg gtacgaaaat	360
ggattccaac cattaaaatc tccagtaaga aaaactcctt ctgctcccgg ggcccattct	420
ttgcagtata aaccaccatc agcacatctg tggacgccaa atgattcata gcctctggaa	480
aacttatcaa taccaccttc attttctcca atgttcttca aaatttggct aaactgctta	540
tacctgcgct ggaagtccac ggcgtagggc ttcaagtacc ggtcgatctc caggagtctg	600
g	601

<210> 305

<211> 401

<212> DNA

<213> Homo sapien

<400> 305

aaataacagc atgtaaaata ttaaaatata agctttcaaa aataaataca taaataagta	60
gaaccctcgt aagaaatagt caaacacatt aagtcctttc cagctgtccc tagaaagctg	120
ctgttctctt tttcattttc agctctggta agggcagggg ccaccctgca ggaagtgtca	180
atgatacgct gataagcttc ttacttctct cctgtcagtt ggtgctcccc ctgtgatgag	240
aaaaggggta ctgttgacag tgctaaggaa ggctgctctt ctgtcactct gaagttgctt	300
ggaggggatgt ccccatgcag actctctccc agccctccac tcaggggaagg tctgtctgta	360
cccactgcct tctatagcag aaaacttgca ctccctgaatg c	401

<210> 306

<211> 313

<212> DNA

<213> Homo sapien.

<400> 306

aaactgacta tggattcctt gaaggtctgg cagttgttga tgatggcgat catgtactga	60
acgtagcagt gagggtgctg ccgattcctc aggtgctctt ctttatacag ctgcgcttca	120
tctttatatac tgaggacaga caggcttcgg tcagacagca ctaagggcaa catggagctg	180
tttcaaatac cagctgacg tcacgcctgg cctgaaattt cacatcata acatctgacc	240
ggatgagcct ctaaaaaataa aacaatcttt agacgatcca gactaatgga aggacagaga	300
ggttgattac ttt	313

<210> 307

<211> 366

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(366)

<223> n = A,T,C or G

<400> 307

aaagatgctg ntaatgaaca ttacggacaa ttcatgggtg ggctagtgtg taacacttca	60
gctgattttt cttatgagat ggaaaaaaaa aatcagccaa gtaagggcac atcttcactt	120
cattttataag tcagcatcca aggtaaaaga attctctgtt ggacttgaca tcactcccat	180

cctctgatac	tcgcctactc	tcttctcaaa	gaagttagnt	ctttccttcc	antgaaatat	240
tctcataaaa	gtcaaattgg	ttctctactc	tgaaaacctt	gctaaaaccc	aattccagca	300
taagtttgtc	tgncacaaac	ncaatgnatt	gcttcattaa	antgcaattc	atcccaatga	360
gcttcc						366

<210> 308

<211> 534

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(534)

<223> n = A,T,C or G

<400> 308

ccagctatca	gctgatacgc	ttctgtctgg	acgctcgtec	tgcttctgac	atcaaaatct	60
tctgtctcaa	agtcagagtc	atccaactcc	tcaggggtcc	ttatcatcag	caactgcttc	120
ctgatgtccc	ggatgccatc	atataccagg	cggaagcat	cgataaactc	attctcatcc	180
atgggctggg	cagggctcga	gctgagggtc	tccacggctg	cttctacttg	ctcagtaaaa	240
cgtggcatga	ctgtgttgga	gagcagctta	gtggcttcca	gaaccttctc	tgtgtagact	300
cctggctcat	agtcgtccat	ctctgagggtg	actacgtgaa	tgacccgggc	tgcccggcct	360
cgaattgcac	cagctgtgcg	gccaggccat	ccacatcctt	ctcttgagga	gcaatgacac	420
atttggtcac	atcttccaaa	atgtgattct	ctgagacagc	caagaagtca	tcaatggaag	480
taatgncatc	gacagcatct	gtgagaacac	cgacttggtt	ttccattgnt	cttt	534

<210> 309

<211> 164

<212> DNA

<213> Homo sapien

<400> 309

catactcctt	acactattcc	tcatacccca	actaaaaata	ttaaacacaa	actaccacct	60
acctccctca	ccaaagccca	taaaaataaa	aaattataac	aaaccctgag	aacccaaatg	120
aacgaaaatc	tgttcgcttc	attcattgcc	cccacaatcc	tagg		164

<210> 310

<211> 131

<212> DNA

<213> Homo sapien

<400> 310

aaaaatcatt	tatctttcgg	tgcttcaaca	tgatgccaaa	caaaaatcta	ctgaataaaa	60
atagcaagga	aggggaatcaa	acatttataa	gatataattta	ttatttttct	gaccaaagtg	120
caatgatttt	t					131

<210> 311

<211> 626

<212> DNA

<213> Homo sapien

<400> 311

cctatgtgcg	ccagtttcag	gtcatcgaca	accagaacct	cctcttcgag	ctctcctaca	60
agctggaggc	aaacagtcag	tgagagtggg	ggctccagtc	agaccgcgca	gatccttggg	120
cacctggcac	tcaagcattt	tgacgatgt	ctcaaccaac	atctgacatc	tttcccgtag	180

agcaacttcc	tgctccacgg	gaaagaggtc	gatggattta	cccctggacc	cataagtctg	240
ttcatcctgc	tgaagtcccc	tccccattgc	tccttcaagc	caaaactaca	ctttgctggt	300
tcctgtcccc	tctgagaaaag	gggatagaaa	gctccttcct	ctatgtcctc	ccatcgagat	360
ctgttctggg	gatggagctt	ccaacttcct	cttgacgagc	gaaagaatgc	tgctcacccct	420
tctgtcttgc	agagtgggat	tgtgggaggg	attggcagcc	ttcttctcca	ccacctgtcc	480
agcttcctcc	tggtcagggc	tgggaccccc	aggaatatta	tgttgccgtg	tggtgtgtgtg	540
tggtgtgtgtg	tccttcttta	gggagcagga	gtgcactctg	taattgaggg	tagatgttgt	600
gtgtgctggg	gaggggtcct	tctgtt				626

<210> 312

<211> 616

<212> DNA

<213> Homo sapien

<400> 312

aaaccaaaga	aattaagaaa	aaagacttca	ttgcttgaat	gacgcgaaca	gctgtctgag	60
tcacctagac	tttaacacca	cctggggccc	tgggaatgac	gctgacgaga	gatctgcaca	120
tagtaggcgt	gggctccaaa	tgtgtctcatc	agctgacttc	acatcctcac	aagtgcgcct	180
cagatatgac	ccaagggata	cgtaccatct	cttcttgaaa	cagcgtgtca	aattatatat	240
atgtatgcaa	aaaagagtaa	tgtactaagc	aaaccaagtt	tcgtcttttt	cttctgaatc	300
tggttttaat	gtgacctgtc	atccccatct	ttcgaattta	tgagctccat	cttctctaga	360
ctgttaactt	cttgaggaaa	acatgctatt	ttaccacctt	tactgtctga	atccctagcc	420
cttaagcaca	gtctctggca	cagaataaat	acgaaatgaa	tgagtgaatg	aatggatgga	480
tgggtgaaga	gaaaaggcaa	tgcacaagat	ttacctatca	aaatccacca	atggtcctta	540
aaaatggttt	tgtcagtaga	gatgctgaat	atattcatat	aatacattta	tttcaatact	600
attaagaatt	ctagt					616

<210> 313

<211> 553

<212> DNA

<213> Homo sapien

<400> 313

aaaaaatggc	agcattgtac	ttgaatcaga	aagcttactg	ggatttcctc	atcgaaagta	60
gagattgcag	ctaattcctag	taccttttgt	tagtaattac	ttaaggcaca	gtgcaaagtt	120
gaaggactgt	tttggtagaa	actcaagcca	gctacatgta	tgcttgccct	ggtatccttg	180
ctagagcaca	tgccgggtata	ataccgtatt	atacacaaca	agccaccctc	gttgatctctg	240
tgttacaatt	aaacatcagt	cccagaaagt	gaaccctagt	catttattat	aggtgcccac	300
ctctgacttg	gaacaaaatg	ccactccatt	catgttcatt	tttgtccttg	agaggattta	360
tttcctaaaa	gattctgaaa	gccaacaaat	caatgtagtt	cttcatagag	aacttaagag	420
taaggctcaa	aatggcctca	aaatgggctt	cttggatgac	ttccaacagt	gactggcctt	480
ctcaacactg	cagatgtctg	agcactacca	taacctaacg	aagtgaggaa	ggaggaggca	540
aattgggtatt	ttt					553

<210> 314

<211> 330

<212> DNA

<213> Homo sapien

<400> 314

ccagcgactc	cagcgggtggc	agcaggcagt	gcacgtactc	tgggcctccc	accagggtag	60
tgaagggttc	cagctgttct	gccagggccca	ggaggacctc	atcttcatca	tagatgggtat	120
ctgtaaggaa	aggcagaagc	tcacttcggg	tcctttcaac	cccaagggcc	aaggcgatgg	180
tggacagctt	cttgatgctg	ttgaggcgaa	gctgaacgtc	ctcattgcgg	agttcgtcta	240
tgagcaccgc	gatgggggtac	agcaggtcgt	cgccgtcggc	cgccgccatc	ttggctccgt	300

ccctttcctg tcagactgcg gccagcgctg

330

<210> 315
 <211> 380
 <212> DNA
 <213> Homo sapien

<400> 315

aaaaatgaca ttgcgttttag cttattgtaa gaggttgaac ttttgatttt tgtaactatc	60
tttaagccct tcagtttata attcatataa aatgcctttt gtatttaaaa taatcctatt	120
ttaatcagtg catgaaattt gcttttttaa agttcatttg aatgattatt ccttccctct	180
aaagaaatga ttttggtaat gttgagaggt accttaccac aaatcctaac tgtaagtgtg	240
ttcatgggtta ttttcaaaag aattatgact cttcccaaaa agaatcctaa aaaacttgta	300
ataaacctat aaagctgatt tgcataattta caaaattttg aatagcaaat ataggcaact	360
catatatgta tataattttt	380

<210> 316
 <211> 222
 <212> DNA
 <213> Homo sapien

<400> 316

aaactacaga gggttttcca gctattattt ccttttagttt ctaaaagtaa cgacttatat	60
taatgtttta taaaagatag tgatgaaaaa aaggtaatgc tgaaataaag gcgcttttag	120
aaatatttaa ggacaacata aggtattaat attggaaaaa aactgtacat attttcaagc	180
acaacactga aatattgcag cagtgtttta ctgaattgtt tt	222

<210> 317
 <211> 490
 <212> DNA
 <213> Homo sapien

<400> 317

ccttgaatga gcgtggagag cgattaggcc gagcagagga gaagacagaa gacctgaaga	60
acagcgccca gcagtttgca gaaactgcgc acaagcttgc catgaagcac aaatgttgag	120
aaactgccta tcctggtgac tcttcttaag agaaactgaa gagtttggtc agcagttttt	180
acaagaattc gggacctccg cttgcttctt tttttccaat atttggacac ttagagtggg	240
ttttgttttt tcttttcaga tgtaaatgtg aaagaaaggg tgttgcattt ttacatttcc	300
ctaagatct tgctaataaa tgctacaata gcctcggtt cattttgggt ttttgcttcc	360
tcccactgtg tgatgtgtg tatatgtatg ttttgaatat gttttcttta ttaaaaaata	420
ttttttgtag tttgaatatg aaatttggac caaatgataa actgcgctga gtctaaactg	480
gcaacatgta	490

<210> 318
 <211> 340
 <212> DNA
 <213> Homo sapien

<400> 318

cctggagtcc aataaccacc ccctcatacc acaccctgtg catacaccag ccaagccttt	60
cctgggtctgg gaagggaaga gaaaaaagac gcaggccacc tgggggttct gcagtctttg	120
gtcagtccag ctttctatct tagctgcctt tggcttccgc agtgtaaacc ttgcctgcc	180
ggaggcagga ggcccagctg gacctccgag ggccatgagc aggcagcagc catcttggcc	240
tcaagcttgc ctttcccttg agtccctctc tcccctcggc tctagccaga ggtgtagcct	300
gcagatctag gaagagaaga gctggggagg aggatgaagg	340

<210> 319
 <211> 373
 <212> DNA
 <213> Homo sapien

<400> 319
 aaagatgctg ttaatgaaca ttacggacaa ttcattggtg ggctagtgtg taacacttca 60
 gctgattttt cttatgagat ggaaaaaaaa atcagccaag taagggcaca tcttcagttc 120
 atttagaagt cagcatccaa ggtaaaagaa ttctctgttg gacttgacat cactcccatc 180
 ctctgatact cgcctactct ctctctcaaag aagttagtct ttccttccag tgaaatattc 240
 tccataaagt caaatgggtt ctctactctg aaaaccttgc taaaaccag ttccagcata 300
 agtctgtctg ccacaaactc aatgtattgc ttcattagag tgcaattcat gccaatgagc 360
 ttcacaggca agy 373

<210> 320
 <211> 509
 <212> DNA
 <213> Homo sapien

<400> 320
 aaaaacaaaa ttaaattttc atttcaatta agaccctttt tggcattttg cttacttatt 60
 ctgccctttg gttaacagca tcagcatcac attactattt tatattgcat atatgtagca 120
 tttgcttctt taagttttca acatatcatt tatattttaa ggcagacact gagttagtat 180
 taatagatta actaaactgc actgtaatat agataaaatt actgtgtctc actgtgtatt 240
 acatgcaaaa tccacataaa ttgtcattta accaacagta ctgcacgagc gaacatctcg 300
 atatatgaaa actgcatcat caattcaacg ttttgggtact tgaaactgca tcataaatgc 360
 aacattgtca tatgtgaaaa cgacacccta agtcttctct tttaaaaatg acattgcgtt 420
 tagcttattg taagagggtg aacttttcta ttttgaact atctttaagc tcttcagttt 480
 ataattcata taaaatgcct tttgtattt 509

<210> 321
 <211> 617
 <212> DNA
 <213> Homo sapien

<400> 321
 ccaaggcccc ttttgcagcc cacggctatg gtgccttctt gactctcagt atcctcgacc 60
 gatactacac accgactatc tcacgtgaga gggcagtgga actccttagg aaatgtctgg 120
 aggagctcca gaaacgcttc atcctgaatc tgccaacctt cagtgttcga atcattgaca 180
 aaaatggcat ccatgacctg gataacattt ccttcccaa acagggtccc taacatcatg 240
 tcttccctcc cacttgccag ggaacttttt tttgatgggc tcttttattt ttttctactc 300
 ttttcaggcg cactcttgat aaatgggttaa ttcagaataa aggtgactat ggatataatt 360
 gagccctctg gtccaggctc cagtttacct aatattacct cagaaaggat atggagggaa 420
 gatgatcttt ttgccaggtc tgacttttct tctgtctcgg cctccatta acgctcagta 480
 ccttttagca gctgacggcc ccacgttcta ctccatgctt ggcttctttt ccaactagct 540
 ctttcatata ttttacttgc tagtatctcc attctctcta aagtatgggt tctttttgcc 600
 cttaaactta aattttt 617

<210> 322
 <211> 403
 <212> DNA
 <213> Homo sapien

<400> 322

```

aaaaagaagg acttaggggtg tcgttttcac atatgacaat gttgcattta tgatgcagtt      60
tcaagtacca aaacggttgaa ttgatgatgc agttttcata tatcgagatg ttcgctcgtg      120
cagtactggt ggtaaataga caatttatgt ggattttgca tgaatacac agtgagacac      180
agtaatttta tctaaattac agtgcagttt agttaatcta ttaatactga ctcagtgctt      240
gcctttaaat ataaatgata tgttgaaaac ttaaggaagc aaatgctaca tatatgcaat      300
ataaaatagt aatgtgatgc tgatgctgtt aaccaaaggg cagaataaat aagcaaaatg      360
ccaaaagggg tcttaattga aatgaaaatt taattttgtt ttt                403

```

<210> 323

<211> 298

<212> DNA

<213> Homo sapien

<400> 323

```

ccagaattag ggaatcagaa tcaaaccagt gtaaggcagt gctggctgcc attgcctggg      60
cacattgaaa ttggtggctt cattctagat gtagcttggt cagatgtagc aggaaaatag      120
gaaaacctac catctcagtg agcaccagct gcctcccaaa ggaggggcag ccgtgcttat      180
atcttttatgg ttacaatggc acaaaattat tatcaaccta actaaaacat tctttttctc      240
ttttttctcg aattatcatg gagttttcta attctctctt ttggaatgta gatttttt      298

```

<210> 324

<211> 78

<212> DNA

<213> Homo sapien

<400> 324

```

ccatgggaag gtttaccagt agaatecttg ctaggttgat gtyggccata cattccttta      60
ataaaccatt gtgtacat                78

```

<210> 325

<211> 174

<212> DNA

<213> Homo sapien

<400> 325

```

ccatcatggt caggaactcc gggaagtcaa tggccccgtt cccatctgca tccacctcat      60
tgatcataac ctgcagctct gcttcagtggt ggttctgtcc cagggatctc atcactgtcc      120
ccaactcctt ggtggtgata gtgccatctc catccttgct aaagagggag aagg          174

```

<210> 326

<211> 679

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(679)

<223> n = A,T,C or G

<400> 326

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aaaactgaaa tacctcttaa aataatttga tccccagcgt ttgctctttt tgaagtaacc      60
aacttactct taataaggat ggntgccaaag atggaaagtc ttactgggtt ttcatgttaa      120
cctattcttt ggacataact atgaattttg tatacaatgc acttcatgaa aagttgtggc      180
tccccagat  tgcccacaag tgtgatcttg aagtcctaaa catttggtcca tgtaagcttc      240
aaaacagcgt taactgagtt attcaagtag cagtacttaa agatacaatt cttgaagcag      300

```

```

tttcaatggt ttctgatcca aataatcagt ttctgaacat tactacttca cataatagag 360
tccatcttca gtttcttctc actttctctt tcccttttgg gtttcctttt tgtggcctga 420
ggccaccagt tctttgggta ctatcaagat acttccatca tgggtacact ggagagcata 480
gtggttggga ttgactggcc taccttgggc atctcttaat ctactaaaaa tatcatgata 540
aaggctcatgc agtttctggt tcattatggt aatagctttg gtacattgtg cttgctctct 600
cttaanagtt tccttctttg cttgcaagtt acatacatca tcttctaaat tcaaaattat 660
gtccattttg gcgtttacc 679

```

<210> 327

<211> 619

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(619)

<223> n = A,T,C or G

<400> 327

```

aaaataagtt actggtaaat ggagttgcat tctatagtca cttataaat attaacaaaa 60
tatttataac tggaaacctta atgaaatgta tcatcaaatc aggtataaac aacttgccg 120
cagttaccaa agcctanata cgcgttagat ggccttttc cggcctgtgc gtctgctctg 180
gttctcttca ggcagcaaag ctggggaagg aagctcaggc aggagcctcc ccgacgccac 240
aacggcacia gcagcagcta aagcaccgca ctttgctcta ctaacctttt acttaaatga 300
ggttttgcca aatccacatc tggaaaccgag tcacacccat ttgcaaggat gtttggttctt 360
tgatgaaact gcattctctac tgcacatgag ggctttcatt gtaggacaag aggagagttc 420
gtttattttt gtaactgttt tacatgttcc gattagttaa tcggtagctt atgtcatttg 480
ctatgcctgn agncttctaa tctctcctta ctaaaacatt acttcaaatt tgaattgacc 540
cttgggtata atttatttag ccgggatttg tgtgtcattg tagagcaact ctaattcaag 600
aatagtgaca acttttaag 619

```

<210> 328

<211> 132

<212> DNA

<213> Homo sapien

<400> 328

```

aaatccaaat acaaaagcat agtctctgca agattttgtt ctttgaattt cttgatattg 60
taattgatta ttgataactg tcatcatgaa attatctctc aataataaga taaataaact 120
agcatatgaa tc 132

```

<210> 329

<211> 854

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(854)

<223> n = A,T,C or G

<400> 329

```

ccttgaggta actattgcaa aatatacagt gtaagttcag tctgatggaa accccagatt 60
catcaaggat acaaatctac agtagcccaa tggcggtttc atagtgtata atttattatc 120
aataaaatta actccgttac aatcagcatt catttcctcc aattaaaatt aagcataaac 180

```

cctaggtagt	aaccttctgc	acatatgtat	agctccgaat	ttcctcactg	ttcgtctggt	240
gcaaaaacaa	tattcaagct	tgtctgatta	tgcataattt	ctttaatcat	atagattata	300
tatacaatag	acaagacagg	actatataga	taatggacag	acttaaattg	ccgcattttt	360
aaggtggaga	aaatgatgaa	tctatgcatc	cccagagaaca	cttaaaattt	ttttttattt	420
cactgggaaa	ttcttacagc	tactttacaa	tcataggtta	acagcctagt	tatacagaag	480
acataattcca	ctacagagct	atactctatg	caactgtttt	ttcccctcat	aaacaacctg	540
agttcaaatt	gaattctatc	ttccacaatc	acaatgggtg	catcacccag	tacacagaag	600
tttgaatcac	aaaacataat	taccacaata	aaacacagtg	ttcaagtatc	ttggcagagc	660
aatctgccgc	acaaactgca	aattaaatta	actacacaga	ctaaaaacta	tacagcctac	720
catcacagtt	gtgcattata	aaaaagggag	tttctttcct	ttggttttaa	gtcaggaaca	780
gggtaggatt	ttttaccctc	nggccgggga	ccacgctaaa	ggggcgaaat	ttcttgccan	840
natattccnt	tcac					854

<210> 330

<211> 299

<212> DNA

<213> Homo sapien

<400> 330

ccaatgaata	actgacttta	taatcctggg	caatcagctt	ttggcggtt	gtaagtgtt	60
ctcgacactt	ttcactcatg	gattcttcaa	atztatgtt	aaagaggcac	ttatacactc	120
tgccttcacc	agcttgtgta	ttttcacaaa	aacgctcccg	atcatctcgg	caagcaaaat	180
ataaatgccg	gtctaagtga	aagtcatccg	atgacagctc	agccaccggg	agaatggctt	240
tcttgacagag	ttcagaaaact	tgaatcttgg	gttctctttc	ttctgcttct	ttcaccagg	299

<210> 331

<211> 573

<212> DNA

<213> Homo sapien

<400> 331

aaagatatga	acagcttaat	tttccgtgtg	attatctaata	taaaaaagaa	aaacaaaaca	60
agcaaaatgt	tcaagttaaa	aaaaaaacat	accgggtgag	caatgcacta	aaattatcca	120
catgaaaaca	aatggtctgt	aatcttataa	accaacatag	catttctactg	tcaacaatgt	180
gaaaatttaa	tatcttctca	aacaggcata	agatgaagaa	gtgctatttt	ttaattgtaa	240
aagggaactta	tgtaattgtaa	aattacatta	taatttttca	ttccgaattg	acaaatgatt	300
tcaaaaacaa	ggatcaaagt	ttgactgcaa	atagtaatgc	aatataattt	cataaaaatc	360
cttcaatttc	tatttttttc	cttttctgta	gttgacatat	gaagaccact	tcaattttcta	420
aaaaagggaa	ccattccaat	tttccctccc	caagaaaatg	tctcacaatt	acaaagtaga	480
aaaacagccg	ttcataaatg	caaaaaaatt	ctgatttata	tatgaaataa	tttctagatc	540
aattcaacat	atttgatgac	atttgttgag	ttt			573

<210> 332

<211> 555

<212> DNA

<213> Homo sapien

<400> 332

aaatttgaaa	gttgtaagca	ctgatgttaa	tgtgattgat	cagcatgggc	atatgtaaaa	60
tgtccttttc	tggttgcttc	tctatgctat	tgtgttcaga	tacttacacc	ataattaaac	120
agtaagttat	agacttgctg	agtttgcat	agatagtgcg	ctcatttaat	ctgtgcctct	180
caaaacttca	gaatattagc	atattaccac	aaataatttt	tggtgaaact	attgagatat	240
taaaattttt	gaaatcacta	ctgttacctg	ttatagaaaa	tagtgttggc	ttagtctagt	300
ctctgtgtaa	ctgggttacat	tttgatggtt	gtctatactc	aactggatat	gtgtatgtaa	360
attagaaaaat	acatacctat	ccagacataa	atgctaagta	acattttttt	cttcctccaa	420

ctacataatt tgtagctcat catttttccct taatcctttc ctaacttgtc gcagcagttt	480
gaatttccca gatatttatg tttgaacata atgggtcaga atacatattt gaacatcata	540
gttgatatata ttttt	555

<210> 333

<211> 460

<212> DNA

<213> Homo sapien

<400> 333

aaattttcttt caacagtcta ttgggggtcca aaaagcatat atcaaaacaa aaataacaaa	60
agcaaaacaa aatgctacat gtaaaagcta aagaaagaaa atgcagcata ttcaggttct	120
ttttcttgag gtacctatat aaatttaatc acctgcccc aagtcctctc gttaggttaa	180
aaacacaatg cgtcctgggg agccaattgc ccggcacgtc ttattactga gaaagtgcaa	240
gaatgctgat catcttatgc agcactactaa aggatgattt actctttaca aaatagagct	300
taagtatcaa cctgatggaa gttagaaaat taaaaacatt taagtagaat catctctctc	360
tctatttttg agatcctgca gcaaaaagcc tcccaaatca actttcaaag ttctgccatt	420
aaggaatggt ggttctcttg taaaattcag agatctcttt	460

<210> 334

<211> 190

<212> DNA

<213> Homo sapien

<400> 334

ccaaggaagg ctgtgctcta gcccactctga cctgtctctc aaaccacctg ggggacaagg	60
ctgatagaga cctgtgcaga tgtctctctc tgtgccccct actcatctca ctggatctgt	120
ctgccaacc ctgatcagc tgtgccagct tggaagagct cctgtccacc ctccaaaagc	180
ggccccaagg	190

<210> 335

<211> 394

<212> DNA

<213> Homo sapien

<400> 335

aaatttgagc agacttctag cggacagtta cttctcaaga attttctata caaaagctgt	60
gccaggcata tatttttctca ccaggacaca tggggcagcg gacccctggt gtcagtaaga	120
acacacccag aatgatataa ccagatattt ttcagtttct aaattaaggc atattcaaaa	180
aattccatgt acaagtttac accacttttc taagtactc accaggtaat taaagcagat	240
tcacagatga attactctca gttaactat atgcaacaac catgccaata acttttcttc	300
taaattttgc ataataatgg ttaaaaaaag tggtagttta actatcatgt tcacaattgt	360
catttttcaa ggcagtagaa gaccaagaca tttt	394

<210> 336

<211> 429

<212> DNA

<213> Homo sapien

<400> 336

aaaagctatc accattgtag tagaatcatc cttctttttt gaaatttgaa gcatcccagg	60
cttaaaatct tgtgtttcag aaagacagtt tataccatga ctgcttaatt atcccccaa	120
agaccttctg attgaagtca tgtacagttc agtggcctaa attctctgcc tttttaactt	180
gctttgcaag cctactctga aaataagtta tttagtcaag ttattctcaa agatgtocca	240
gttgccctaga aaggatcaaa tggaacattt gacacacata ctcaaaaaaa tgtaactgac	300

tataaact	ttaaccta	catctgtatc	aaactttcta	aaaatcaaat	ctcaggattg	360
ttccacttta	gagattctat	gtaaagttta	tataactata	cttgtcaaat	agcacctatc	420
tatgcattt						429

<210> 337

<211> 373

<212> DNA

<213> Homo sapien

<400> 337

aaagatgctg	ttaatgaaca	ttacggacaa	ttcatgggtg	ggctagttgg	taacacttca	60
gctgattttt	cttatgagat	ggaaaaaaaa	atcagccaag	taagggcaca	tcttcagttc	120
atctagaagt	cagcatccaa	ggtaaaagaa	ttctctgttg	gacttgacat	cactcccatc	180
ctctgatact	cgcctactct	cttctcaaa	aagttagtct	ttccttccag	tgaaatattc	240
tccataaagt	caaatgggtt	ctctactctg	aaaaccttgc	taaaacccag	ttccagcata	300
agtctgtctg	ccacaaactc	aatgtattgc	ttcatcagag	tgcaattcat	cccaatgagt	360
ttcacaggca	agg					373

<210> 338

<211> 366

<212> DNA

<213> Homo sapien

<400> 338

ccatccccct	atgagcgggc	gcagtgatta	taggctttcg	ctctaagatt	aaaaatgccc	60
tagcccactt	cttaccacaa	ggcacaccta	caccctttat	ccccatacta	gttattatcg	120
aaaccatcag	cctactcatt	caaccaatag	ccctggccgt	acgcctaacc	gctaaccatta	180
ctgcaggcca	cctactcatg	cacctaattg	gaagcgccac	cctagcaata	tcaaccatta	240
accttccttc	tacacttatc	atcttcacaa	ttctaattct	actgactatc	ctagaaatcg	300
ctgtcgcctt	aatccaagcc	tacgttttca	cacttctagt	aagcctctac	ctgracgaca	360
acacat						366

<210> 339

<211> 319

<212> DNA

<213> Homo sapien

<400> 339

ccttccctcc	ccaccaccat	caacctcttc	aaaacctact	ccctccctct	aagtatctct	60
caacacagta	tgtctggggc	tagatttcaa	aacccacgta	atgaaaaagt	cagttttaca	120
agcctaattt	tgttggtttt	ttttttatat	caattaacgt	taaaaattgc	atcaactatt	180
taattcatga	ggatctttca	tattaaaatt	taaccttaag	attcaaccgc	catgtgcttt	240
tataaaggaa	acattttttt	gagacgtctg	agctcacttt	tacatgggtg	tgccactctg	300
cgtaaatgtt	tgtgattttt					319

<210> 340

<211> 278

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(278)

<223> n = A,T,C or G

<400> 340

ctaataaaat	gaattaacca	ctcattcatn	natctaccca	cccnatccaa	catctccnca	60
tgatgaaacn	ncggctcact	ccttgggcgcc	tgccctgatcc	tccaantcac	cacaggacta	120
ttcctagcca	tgactactn	accagacncc	tcaacngcct	tttnatcaat	nggncacatn	180
actcganacn	taaatnatgg	ctgaatcatc	cgctacctnc	acgccaatgg	cagcctcaat	240
attcttttatg	ctgcctcttc	ctacacatgc	gggcgagg			278

<210> 341

<211> 400

<212> DNA

<213> Homo sapien

<400> 341

ccagcatggg	gctgcagctg	aacctcacct	atgagaggaa	ggacaacacg	acggtgacaa	60
ggcttctcaa	catcaacccc	aacaagacct	cggccagcgg	gagctgcggc	gcccacctgg	120
tgactctgga	gctgcacagc	gagggcacca	ccgtcctgct	cttccagttc	gggatgaatg	180
caagttctag	ccggtttttc	ctacaaggaa	ttcagttgaa	tacaattctt	cctgacgcca	240
gagacctgc	ctttaaagct	gccaacggct	ccctgcgagc	gctgcaggcc	acagtcggca	300
attcctacaa	gtgcaacgcg	gaggagcacg	tccgtgtcac	gaaggcggtt	tcagtcaata	360
tattcaaagt	gtgggtccag	gctttcaagg	tggaagggtg			400

<210> 342

<211> 536

<212> DNA

<213> Homo sapien

<400> 342

aaagaacaat	gggaaaaaca	agtccgtggt	ctcacagatg	ctgtcgatga	cattacttcc	60
attgatgact	tcttggtgt	ctcagagaat	cacattttgg	aagatgtgaa	caaatgtgtc	120
attgctctcc	aagagaagga	tgtggatggc	ctggaccgca	cagctgggtc	aattcgaggc	180
cgggcagccc	gggtcattca	cgtagtcacc	tcagagatgg	acaactatga	gccaggagtc	240
tacacagaga	aggttctgga	agccactaag	ctgctctcca	acacagtcac	gccacgtttt	300
actgagcaag	tagaagcagc	cgtggaagcc	ctcagctcgg	accctgcccc	gcccattggat	360
gagaatgagt	ttatcgatgc	ttcccgcctg	gtatatgatg	gcatccggga	catcaggaaa	420
gcagtgctga	tgataaggac	ccctgaggag	ttggatgact	ctgactttga	gacagaagat	480
tttgatgtca	gaagcaggac	gagcgtccag	acagaagacg	atcagctgat	agctgg	536

<210> 343

<211> 646

<212> DNA

<213> Homo sapien

<400> 343

aaaacttcta	ttcatcaaaa	gacataaaga	aaacagtcaa	gccacagact	aggtgtaata	60
tctcaatata	tatatccgac	aagagaattg	catctagaat	gtataaagaa	tttctatgac	120
ccaattatag	ctatcaggga	tatacaaat	aaaaccaaaa	tgaaacatca	ctacacaccg	180
attggaatgg	ttaaaaagga	aaaatactga	caacaccaat	atttgtaaag	acaggaggta	240
ccagaactct	cattcattat	attcataaat	tgacaaatat	aaaaactgct	atagtagggc	300
agtcttcctt	agaaagggat	tgtgggcgat	acagagaaca	atattaatct	gtccattata	360
ttccttaact	gtaaaatgga	gaccatatgt	tccaccagct	tcacttggtg	attatgatac	420
atggctatta	agagactcaa	atgactccat	ttcatcaact	aatatgccct	gtcaattcta	480
cttctaaagt	atcccatgtt	ctatccaatg	tcataccact	atcataattt	aagtgttcat	540
aactctctat	aatatttcaa	taatctaact	ggctcctaag	cctgtagtag	aaattgcaga	600
ttgggctccc	caatttctgt	tccctaggaa	ggctgagaaa	gctttt		646

<210> 344
 <211> 383
 <212> DNA
 <213> Homo sapien

<400> 344
 cctgcacccc agtataaggg cctccccagc tgagtaagaa gctgcttccc ctccctctcat 60
 aggccaagcc tattgtgtga aaccatctca tggctcttgg gacgtagacc atttttgaaa 120
 ccgtctcatg gtcttggtga cgtagaccgt ttgcttcttt aactccagcc gcggaatgac 180
 attagtggaa ccgggctagg gaactgctgg aagttcagga tggcaccacc ttgaacacct 240
 aggccagggg tccccacat gtcccgggtt tctttcttcg ayagtataga accgttcatt 300
 ctgcttttgt gtcccattcc atctcttgaa aaaatgtagt ctttgaatgt gtgaaaatct 360
 agggacattc aatctagtct ttt 383

<210> 345
 <211> 263
 <212> DNA
 <213> Homo sapien

<400> 345
 cctccccctt ccctttgctg gtgggaggag ctctgtgtct ccttggccgc ttactggaag 60
 ggcgtttttc agagctgcag ggacagggtg agcagctgaa gggctaggag ggaagccggc 120
 ccccgctctg cagaagctgc atttcagctg aatctgtgtt tcagcctcag ttgggtgcac 180
 cgtttagccc tctcctcccg gatggctcatg tttttgtcac attagagaat aaacagccac 240
 acacacattt ttttttttcc ttt 263

<210> 346
 <211> 132
 <212> DNA
 <213> Homo sapien

<400> 346
 aaatccaaat acaaaagcat agtctctgca agattttgtt ctttgaattt cttgatattg 60
 taattgatta ttgataactg tcatcatgaa attatctctc aataataaga taaataaact 120
 agcatatgaa tc 132

<210> 347
 <211> 564
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(564)
 <223> n = A,T,C or G

<400> 347
 cctgggtatc cagggagggt ctgcagccct gctgaagggc cctaactaga gttctagagt 60
 ttctgattct gtttctcagt agtcctttta gaggcttgtc atacttggtc tgcttcaagg 120
 aggtcgacct tctaattgat gaagaatggg atgcatttga tctcaagacc aaagacagat 180
 gtcagtgggc tgctctggcc ctggtgtgca cggctgtggc agctgttgat gccagtgtcc 240
 tctaactcat gctgtccttg tgattaaaca cctctatctc ccttgggaat aagcacatac 300
 aggcttaagc tctaagatag ataggtgttt gtccttttac catcgagcta cttcccataa 360
 taaccacttt gcatccaaca ctcttcaccc acctcccata cgcaagggga tgtggatact 420
 tggcccaaag taactggtgg taggaatctt agaaacaaga ccacttatac tgtctgtctg 480

aggnagaaga taacagcagc atctcgacca gcctctgcct taaaggaaat ctttattaat 540
cacgtatggt tcacaagata attc 564

<210> 348

<211> 321

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(321)

<223> n = A,T,C or G

<400> 348

gcncatgaac anggagcaac ganaagagat gtcgggctaa gggcccggga cgggcggcac 60
ccatcctgcn acggaacacn ttcgggttnt ggttttgatt ngttcacctc tgtttatatg 120
cancatattg ntccctcctcc cccaccccag nccccaaact catgcttntc ttccgcnctc 180
agccnccctg ccctgtcctc gcggtgagtc antgaccacn gnttcccctg cangagccgc 240
cgggcgtgag acncngaccc tcnntgcata caccaggccg ggcccnngct ggctccccc 300
gnngccctgt gaaanagctg g 321

<210> 349

<211> 255

<212> DNA

<213> Homo sapien

<400> 349

ccatgacagt gaaggggctg ttaggaatat caacaccacc gaagcgcaca tagatcacat 60
atgtgcccg cttggcagct gtgtagaaga tgtcataggt tccatcttca ttctcaatga 120
catcggcctc ggccctcagtg ccatctgggg tcagaaccgt gcaggtcaact ttacccttcc 180
cggcagtcctt ggcatacaacc acaaagccta cttcttcgcn agttttcaca gtggaggcga 240
ttccaggacc cgtag 255

<210> 350

<211> 496

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(496)

<223> n = A,T,C or G

<400> 350

gggcttattn gctcacaaaa tcattcnctt ttggaactat ggccaattga agctacacac 60
tgaatttatt aatacagcat taagtttctt tgtgtnaaaa aatctttgtn cncagtaata 120
aaaaaagata aggcaagatg cattaacat gaaaccttct ggctcttttc ctctgcgttt 180
ttacagagcc actgatgact atctgcaaca aaagagttaa gtttctgatt ttccgtatca 240
agcatcttat gcctttgctg tggtaagaat tctggccaag caccctgaag gacagatgct 300
ggtgatggnc ttggcactt atgctggcaa actgagcttc tttcccttga gtacttttgn 360
aatgtacaag tagaagaagt cacaagtata ggatggtctg gactacgccg gccaccacag 420
caatgaggtc aaagaagccc tcaaagnaga agcgnccaga tccagttgac aagatacaaa 480
gcacgataga ggccca 496

<210> 351

<211> 109
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(109)
 <223> n = A,T,C or G

<400> 351
 ccatagtga gacctgggaat gagggttact gcagcatctg ggctgccanc cacaggggaag .60
 ggccaagccc catgtagccc cagtcaccc gcccagcccc gcctcctgg 109

<210> 352
 <211> 384
 <212> DNA
 <213> Homo sapien

<400> 352
 ccttcgagag tgacctggct gcccaccagg accgtgtgga gcagattgcc gccatcgcac 60
 aggagctcaa tgagctggac tattatgact caccagtggt caacgcccgt tgccaaaaga 120
 tctgtgacca gtgggacaat ctgggggccc taactcagaa gcgaaggga gctctggagc 180
 ggaccgagaa actgctggag accattgacc agctgtactt ggagtatgcc aagcgggctg 240
 cacccttcaa caactggatg gagggggcca tggaggacct gcaggacacc ttcattgtgc 300
 acaccattga ggagatccag ggactgacca cagcccata gcagttcaag gccaccctcc 360
 ctgatgccga caaggagcgc ctgg 384

<210> 353
 <211> 345
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(345)
 <223> n = A,T,C or G

<400> 353
 ccttgggtcag gatgaagtng gctgacacac cttagcttgg ntttgcttat tcaaaagana 60
 aaataactac acatggaaat gaaactagct gaagcctttt cttgttttan caactgaaaa 120
 ttgnacttgg ncaactttgt gcttgaggag gccattttc tgccctggcag ggggcaggta 180
 tgtgccctcc cgctgactcc tgctgtgtcc tgaggtgcat ttcctgttgn ncacacaang 240
 gccangntcc attctccctc ccttttcacc agngccacan cctnntctgg aaaaangacc 300
 agnggtcccg gaggaaccca tttgngctct gcttggacag canag 345

<210> 354
 <211> 712
 <212> DNA
 <213> Homo sapien

<400> 354
 ccatctacaa tagcatcaat ggtgccatca ccagttctc ttgcaacatc tcccacctca 60
 gcagcctgat cgctcagcta gaagagaagc agcagcagcc caccagggag ctccctgcagg 120
 acattgggga cacattgagc agggctgaaa gaatcaggat tcctgaacct tggatcacac 180
 ctccagattt gcaagagaaa atccacattt ttgccccaaa atgtctattt ttgacggaga 240

gtctaaagca	gttcacagaa	aaaatgcagt	cagatatgga	gaaaatccaa	gaattaagag	300
aggctcagtt	atactcagtg	gacgtgactc	tggacccaga	cacggcctac	cccagcctga	360
tcctctctga	taatctgcgg	caagtgcggt	acagttacct	ccaacaggac	ctgcctgaca	420
accccgagag	gttcaatctg	tttccctgtg	tcttgggctc	tccatgcttc	atcgccggga	480
gacattattg	ggaggtagag	gtgggagata	aagccaagtg	gaccataggt	gtctgtgaag	540
actcagtggt	cagaaaagg	ggagtaacct	cagcccccca	gaatggattc	tgggcagtgt	600
ctttgtggta	tgggaaagaa	tattgggctc	ttacctccca	atgactgccc	taccctgctg	660
gaccccgctc	cagcgggtgg	gggattttct	tggactatga	tgctggggga	gg	712

<210> 355

<211> 385

<212> DNA

<213> Homo sapien

<400> 355

cctcatagcc	gcttagcaca	gttacagaat	gtctgaaggg	gacagtgtgg	gagaatccgt	60
ccatgggaaa	ccttcggtgg	tgtacagatt	tttcacaaga	cttggacaga	tttatcagtc	120
ctggctagac	aagtcacac	cctacacggc	tgtgcgatgg	gtcgtgacac	tgggcctgag	180
ctttgtctac	atgattcgag	tttacctgct	gcagggttgg	tacattgtga	cctatgcctt	240
ggggatctac	catctaaatc	ttttcatagc	ttttctttct	cccaaagtgg	atccttcctt	300
aatggaagac	tcagatgacg	gtccttcgct	acccaccaaa	cagaacgagg	aattccgccc	360
cttcattcga	aggctcccag	agttt				385

<210> 356

<211> 347

<212> DNA

<213> Homo sapien

<400> 356

aaatgagata	aagaaagtct	ccttttgttt	ttagatggaa	aagaaagcac	aagtttttct	60
tacctgrgaa	tgaactttgg	tgacctatat	gtgccattca	tgacgcattt	ttgttcatat	120
tggcttagaa	ttcagtgcat	gaatatcatt	acattcttat	atctaacatt	cctagttagc	180
tttgattcaa	aatatacaaa	atctgatata	tgaatacttt	gctagattaa	tgacttgatc	240
atctttggaa	tgagtaggca	agacgatttt	tacctattat	ttctatgttg	tgggtaatgt	300
taaaactaaa	tacagatgat	aataattgct	atttcacagt	gatgttt		347

<210> 357

<211> 313

<212> DNA

<213> Homo sapien

<400> 357

aaagtaatca	acctctctgt	ccttccatta	gtctggatcg	tctaaagatt	gttttatatt	60
tagaggctca	tccggtcaga	tgtagtgat	gtgaaatttc	aggccaggcg	tgacgtcagc	120
gtggcatttg	aaacagctcc	atgttgccct	tagtgctgtc	tgaccgaagc	ctgtctgtcc	180
tcagatatata	agatgaagcg	cagctgtata	aagaagagca	cctgaggaat	cggcagcacc	240
ctcactgcta	cgttcagtac	atgatcgcca	tcatcaacaa	ctgccagacc	ttcaaggaat	300
ccatagtcag	ttt					313

<210> 358

<211> 403

<212> DNA

<213> Homo sapien

<400> 358

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aaaaagaagg acttaggggtg tcgttttcac atatgacaat gttgcattta tgatgcagtt      60
tcaagtacca aaacgttgaa ttgatgatgc agttttcata tatcgagatg ttcgctcgtg      120
cagtactgtt ggttaaatga caatttatgt ggattttgca tgtaatacac agtgagacac      180
agtaatttta tctaaattac agtgcagttt agttaatcta ttaatactga ctgagtgtct      240
gccttttaaat ataaatgata tggtgaaaac ttaaggaagc aaatgctaca tatatgcaat      300
ataaaatagt aatgtgatgc tgatgctgtt aaccaaaggg cagaataaat aagcaaaatg      360
ccaaaagggg tcttaattga aatgaaaatt taattttgtt ttt                          403

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<210> 359

<211> 411

<212> DNA

<213> Homo sapien

<400> 359

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aaataaatac ttagaacacg acttggtccc tacaagcatc tggactctag gtctcagtac      60
tggagtgtct caccatggg cccacgcag ggacgccacg gtccctccc acccctgat      120
caagacacgg aatcggtgc cgatggttg atcgcaatgc gcccttttc tagagccttc      180
cccgcccatc tacaggcagg atgcggctgg gaaaaagaca actggaattt ctgaagggtt      240
gatggtccgc acggttgagg attctacgtg gttctcttgg tcccctggg gtgtgtgtgt      300
gtggaggagg ccgcggccct tagatcacct tcttgagctc gtcgtacagg accagcacga      360
aggcgccccc catgccccgc aggacgttgg accacgcacc cttgaagaag g                          411

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<210> 360

<211> 378

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(378)

<223> n = A,T,C or G

<400> 360

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cctcttcagg ggcccagacc agggacaggg ccttggtttc cttctccctg gcttctgcct      60
cagctctgtc cctctcatcc gcgtatttgg aagagatgtt tttctcctcg gctaacaact      120
gatcaaatct cctctgcttc tttccagggt tggacacgag ttgccgctgg ttgtccaaat
180caacaaccag gtcgtccagc tctgtctgaa gctgttctt ggtcttttcc agtttatcat
240
aagcggccgc cttctcctcg tactgctggg tgaggntctc gatctccttc tggaaacctct      300
tcttcccttc ttccagagct tccacgngc tggcaaagtc ctgcagcttc ttcttcgagt      360
cggagagctg gatgttga                          378

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<210> 361

<211> 372

<212> DNA

<213> Homo sapien

<400> 361

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aaatactggg ggccattaag agtggatgta gctaagagct tagctaacat tgccttttca      60
ctctattttt ctgagatatt gtaagcattc tgtttttcaa tattgtagtt aattttttgg      120
ctttcaacag cagccctagt aatgggtggag ttgttaatta atgtgtatat tgtactgaat      180
ttctgtcagt taaggggttc actgcttttg tggaaatttg tggaaattgc tagcagggtc      240
cacgatgttt atttttttct ccatgttgta tatcattacc atttcacata cgcgtttcta      300
tttttcttcc tctcctcctg atctccttaa aaatgaatct agagtgggtg gctttttccc      360
cctcctcttt gg                          372

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<210> 362
 <211> 544
 <212> DNA
 <213> Homo sapien

<400> 362
 cctgagtcac ctagcatagg gttgcagcaa gccctggatt cagagtgtta aacagaggct 60
 tgccctcttc aggacaacag ttccaattcc aaggagccta cctgagggtcc ctactctcac 120
 tgggggtcccc aggatgaaaa cgacaatgtg ccttttttatt attattttatt tgggtggctct 180
 gtgtttattta agagatcaaa tgtataacca cctagctctt ttcacctgac ttagtaataa 240
 ctcatactaa ctgggtttgga tgcctgggtt gtgacttcta ctgaccgcta gataaacgtg 300
 tgcctgtccc ccagggtgggtg ggaataattt acaatctgtc caaccagaaa agaatgtgtg 360
 tgtttgagca gcattgacac atatctactt tgataagaga cttcctgatt ctctaggtcg 420
 gttcgtgggtt atcccattgt ggaaattcat cttgaatccc attgtcctat agtcctagca 480
 ataagagaaa tttcctcaag tttccatgtg cggttctcct agctgcagca atactttgac 540
 attt 544

<210> 363
 <211> 328
 <212> DNA
 <213> Homo sapien

<400> 363
 aaactgggtta tgacaaaagc ctttagttgt gtttcttgaa ctataaagaa aacaaatttt 60
 ggcagtcttt aagtatatat agcttaaaat ataattttta gcattttggca ccatatgtat 120
 gccattatat ttgattttgc attactgttt cacaatgaag ctttttttaa ggctttgatt 180
 tttatgatta tgaaagaaat aaggcacaac cacagttttt ctttcttaaa tttcatcact 240
 gttgatgtgg ttcttttgtg ttaaaaaaaaa aaagtgcac tatcaaaact aaaaaattat 300
 agagtaatat tgccgttctg ctgatttt 328

<210> 364
 <211> 569
 <212> DNA
 <213> Homo sapien

<400> 364
 cctgggcacc tctttgcttg aaatatggca agacttggaa aaatgtttgc ccttagaatc 60
 tatctcacta ctttagtttag ttgtctcctt tgggcctggg cacagtctctg gccctgatct 120
 ggaacagact cccttttcta aaactgaact tgaccacatc aaaagtttgt aaaacaatct 180
 ccatggtaat taaacttgca ttcaacacca tatggtaaca gaagatggca aaggataaga 240
 ttcagatctt agatctttcc aagtagggca tgttagatga tagaaggatt agttgcaagc 300
 tggatctgag ctgaggcttg ggcattgaagg aaactgtctc ccatgtgggtt tggaagagtt 360
 aggggtctcc tgagctctat tgtgaactat acgggtttca tccaaggaat ggtatgatgt 420
 gggcataaaa ccattcttca gacaactgaa gatgggtccc ttctgtagcc agaaacacta 480
 gctgtcctgc attgtccatt tccttttagcc ccaggcggtc ctgtgtgtac agggaggtct 540
 cctgtaaggg aatggtttcc ttggcttg 569

<210> 365
 <211> 151
 <212> DNA
 <213> Homo sapien

<400> 365
 aaaaaaaaa atccttttat tatggaattt gtcaaacaca cacacaagca taacaaaccc 60

ctaggtagccc atctccaagt tttagaccct attataattt catcttcagt gttttattat 120
ccacttcttc tctctctatc tttagtattt t 151

<210> 366

<211> 508

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(508)

<223> n = A,T,C or G

<400> 366

agtataaaga tatattccat aaaagagttt ggcagtcaa ganaagcatc gcacttccga 60
aaaacacaag cattcttctc ctagtctaca gagaattgng taaaaaaaaa aaaaaatcat 120
catcaacagc cnccantnta cnccacacta gaatgtacac tccggcaagt aaattaagggn 180
tgcagtcctat ccttgaacga tganaagngg tctgagctat gycaaagngt tanaaagtag 240
cccagctana caaatgcccc agctatcccc aggggagtta ttcagtactt aanacttcat 300
ttccaananc agccccggaa aagccctgac aggaaggggg gaccagngat caccgatntc 360
ccattagggg cggnacacaa aaacaaaatg cctggagctt ntgagcagct gcagcctggg 420
gttgtggcta ggcncngggg gnggttgcaa aaaaacggct gtntccgggg agaggcaaat 480
ggcaggccag ccagccctgg gtacatgg 508

<210> 367

<211> 382

<212> DNA

<213> Homo sapien

<400> 367

cctgagcggc tagtctttaa gatgcgcttc tategtttgc tgcaaattccg agcagaagcc 60
ctcctggcgg caggcagcca tgtgatcatt ctgggtgacc tgaatacagc ccaccgcccc 120
attgaccact gggatgcagt caacctggaa tgctttgaag aggaccagc ggcgaagtgg 180
atggacagct tgctcagtaa cttgggggtgc cagtctgcct ctcatgtagg gcccttcatc 240
gatagctacc gctgcttcca accaaagcag gagggggcct tcacctgctg gtcagcagtc 300
actggcgccc gccatctcaa ctatggctcc cggcttgact atgtgctggg ggacaggacc 360
ctggctcatag acacctttca gg 382

<210> 368

<211> 174

<212> DNA

<213> Homo sapien

<400> 368

ccttctccct ctttgacaag gatggagatg gcactatcac caccaaggag ttggggacag 60
tgatgagatc cctgggacag aacccactg aagcagagct gcaggatatg atcaatgagg 120
tgatgacaga tgggaacggg accattgact tcccggagtt cctgaccatg atgg 174

<210> 369

<211> 216

<212> DNA

<213> Homo sapien

<400> 369

aaatctcatg ggttctatta aaaaaatata tatatagggc cccaatccat tgccatcaaa 60

ttgcccttgg	actttttccaa	ggtatattat	gggggttttat	gcaaaattcc	aagctaccat	120
gtaacttttt	ttaaccattt	aacaaggagg	gggaactgtt	tcctaccttc	tttacatgtt	180
gtgcattgtt	gtggtccaga	aatgccaaac	cttttt			216

<210> 370
 <211> 344
 <212> DNA
 <213> Homo sapien

<400> 370						
ccttgggtcag	gatgaagttg	gctgacacag	cttagcttgg	ttttgcttat	tcaaaagaga	60
aaataactac	acatggaaat	gaaactagct	gaagcctttt	cttgtttttag	caactgaaaa	120
ttgtacttgg	tcacttttgt	gcttgaggag	gcccattttc	tgcttggcag	ggggcagggtc	180
tgtgccctcc	cgctgactcc	tgctgtgtcc	tgaggtgcat	ttcctgttgt	acacacaagg	240
gccagggtcc	attctccctc	cctttccacc	agtgccacag	cctcgtcttg	aaaaaggacc	300
aggggtccc	gaggaaccca	tttgtgctct	gcttggacag	cagg		344

<210> 371
 <211> 741
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(741)
 <223> n = A,T,C or G

<400> 371						
aaattacata	tctaattgtg	tgatttggtta	aatgcccatt	tcttcattcta	agtgtctaagt	60
gctaagtgtg	gcagtttggt	ccttgctaca	ctccaaggca	caaaggagtt	caagggaatgt	120
gcaatggaaa	tcagtttagat	gaatgtgtta	ggaaccttcc	ctttaataaa	gctggatccc	180
acactagccc	ctacaccctc	tcatacccaa	atattcctgc	ttcctctcac	ctgcacttgc	240
tgttctctcc	tctgccacac	aaatctacct	ctcaagccta	ggtcccacct	gcttcatgac	300
aactttccag	actattccag	aacctttaac	catctctgac	ctctcatcag	atctatgttg	360
tacataacac	caattaatga	gatcattact	gctttatgct	ctaattgctt	cctgtattca	420
aaatcttctc	tccaaccaca	taatgactcc	ctaaacttct	cttgattttt	ccaatgcctt	480
gtacaagcac	agaactggtc	aatcaataaa	tactcactgg	ttatttgagg	aaaaaatgtt	540
gccaaagcacc	atcttttatca	gaaaataaat	caattcttct	aaacttggag	aaatcacctc	600
attccttagta	tgtgatctta	attagaacaa	ttcagattga	gaangngaca	gcattgctggc	660
agtcctcaga	gccctcgctt	gctctcggn	cctccctgcc	tgggctccca	ctttggtggc	720
atttgaggag	cccttcagcc	t				741

<210> 372
 <211> 218
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(218)
 <223> n = A,T,C or G

<400> 372						
ccgccagtgt	gctggaattc	gcccttggcc	gcccgggcag	gtaccacaac	agcaggngctg	60

```

agtgagaaat ctaccacctt ctacagtagc cccagatcac cggacacaac actctcacct    120
gccagcacga caagctcagg cgtcagtga  gaatccacca cctcccacag cggaccaggc    180
tcaacgcaca caacagcatt ccctggcagt accttggn                               218

```

<210> 373

<211> 168

<212> DNA

<213> Homo sapien

<400> 373

```

actgctaggg aatgctgttg tgtgcattga gcctggtcgg ctgtgggagg tgggtgattc    60
ttcactgacg cctgagcttg tcgtgctggc aggtgagagt gttgtgtccg gtgatctggg    120
gctactgtag aaggtggttag atttctcact caggcctgct gttgtggt                168

```

<210> 374

<211> 154

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(154)

<223> n = A,T,C or G

<400> 374

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tgagaaatct accaccttct acagngagcc ccanatcacc ggacacaaca ctctcacctg    60
ccagcacgac aagctcaggc gtcagtgaag aatccaccac ctcccacagc cgaccaggct    120
caacgcacac aacagcattc cctggcagta cctc                               154

```

<210> 375

<211> 275

<212> DNA

<213> Homo sapien

<400> 375

```

actgccaggg gacagtgctg tgtcagttga acctgggctg ctgtgggaag ttgttgattc    60
ctgactgggg cctgaggttg tgggtctggc aggtaacagt gttgtatccg ttgagcctgg    120
gctgctgttg gaagttgtag aatgccgact gaggcctggc gtggtggtgc tgtcagggaa    180
tgctgtttgt tgcgttgagc ctggtcggct gtgggaggtg gtggattctt cactgacgcc    240
tgagcttgtc gtgctggcag gtgagagtgt tgtgg                                275

```

<210> 376

<211> 191

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(191)

<223> n = A,T,C or G

<400> 376

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actgccaggg gacagtgctg tgtcagttga acctgagctg ctgtgggaag ttgttgattc    60
ctgactggag cctgaggttg tgggtctggc aggtaacagt gttgtatccg ttgagcctgg    120
gctgctgttg gaagttgtag aatgccgact gaggcctgcc gtggtggtgc tgnatgggaa    180

```

tgctgctagc g

191

<210> 377

<211> 476

<212> DNA

<213> Homo sapien

<400> 377

ccgccagtgt gctggaattc gcccttggcc gcccgggcag gtacatttcc ttgtagactc	60
tggttaatttc ctgcagctcc tggttgggtc tggagcagat gatctcaatg agagagtcct	120
cgtcgggttcc cagccccctc atggaagctt ttagctcaga agcgtcatac tgagcaggtg	180
tcttcaatag gcccaaaatc accgtctcca ggtygccaga taaggctgac ttcagtgtg	240
atgcaagttc ctttttggtc cttctctggt aggcgaaggc aatatacctgt ctctgtgcat	300
tgctgcggtt ggtcaaaatg ttgacaatgg tgacctcacc cacacctttg gtcttgatgg	360
ctgtttcaat gttcaaagca tcccgtcag catcaaagtt agtataggct ttgacagacc	420
catatgcact tgggggtgta gagtgatcac cctccaagcc gagcttgac aggatt	476

<210> 378

<211> 455

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(455)

<223> n = A,T,C or G

<400> 378

agtgtgctgg aattcgccct tggccgcccg ggcagggtaca catcccatct tcaaatttaa	60
aatcatattg tcagttgtcc aaagcagctt gaattttaaag tttgtgctat aaaattgtgc	120
aaatatgtta aggattgaga cccaccaatg cactactgta atatttctgt tcttaaattt	180
cttccacctt cagataatag acaacaagtc tgagaaacta aggctaacca aacttagata	240
taaatcctac caataaaatt tttcagtttt aagttttaca gtttgattta aaaacaaaac	300
agaaacaaat ttcaaaataa atcacatctt ctcttaaaac ttggcaaacc cttccctaac	360
tgtccaagtn tgagcataca ctgccactgg ctttagatac tccaattaaa tgcactactc	420
tttctactgg ctgaatgaag tatggtgaaa caagc	455

<210> 379

<211> 297

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(297)

<223> n = A,T,C or G

<400> 379

agctcggatc cctagnacgg ccgccagtgt gctggaattc gcccttagcg gcggccccggg	60
caggtacaaa gaatccttag acgccatact gagttttaag ttccttaatt cctaatttaa	120
ggcttctagt gaagcctcct cacagtaggc ttcactaggc ccacagtgcc cctagacctc	180
tgacaatccc accctagaca gactttattg caaaatgcgc ctgaagaggc agatgattcc	240
caagagaact caccaaatac agacaaatgt cctagatctc tagtgaggna gaactat	297

<210> 380

<211> 144
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(144)
 <223> n = A,T,C or G

<400> 380
 actttgctga aaattctttt tcccagggtc tataaaacat taatttggtt ttatatattta 60
 ctattttttt gngttttttt gtttttaaata caataagtaa tctaggacta gcattatgtt 120
 tgctagacct ggcatttgct cggc 144

<210> 381
 <211> 424
 <212> DNA
 <213> Homo sapien

<400> 381
 actcttgaat acaagtttct gataccactg cactgtctga gaatttcctaa aactttaatg 60
 aactaactga cagcttcatg aaactgtcca ccaagatcaa gcagagaaaa taattaattt 120
 catgggacta aatgaactaa tgaggataat attttcataa ttttttattt gaaattttgc 180
 tgattcttta aatgtcttgt ttcccagatt tcaggaaact ttttttcttt taagctatcc 240
 acagcttaca gcaatttgat aaaatatact tttgtgaaca aaaattgaga catttacatt 300
 ttctccctat gtggtcgctc cagacttggg aaactattca tgaatattta tattgtatgg 360
 taatatagtt attgcacaag ttcaataaaa atctgctctt tgtataacag aatacatttg 420
 aaaa 424

<210> 382
 <211> 408
 <212> DNA
 <213> Homo sapien

<400> 382
 actcttgaat acaagtttct gataccactg cactgtctga gaatttcctaa aactttaatg 60
 aactaactga cagcttcatg aaactgtcca ccaagatcaa gcagagaaaa taattaattt 120
 catgggacta aatgaactaa tgaggataat attttcataa ttttttattt gaaattttgc 180
 tgattcttta aatgtcttgt ttcccagatt tcaggaaact ttttttcttt taagctatcc 240
 acagcttaca gcaatttgat aaaatatact tttgtgaaca aaaattgaga catttacatt 300
 ttctccctat gtggtcgctc cagacttggg aaactattca tgaatattta tattgtatgg 360
 taatatagtt attgcacaag ttcaataaaa atctgctctt tgtatgac 408

<210> 383
 <211> 455
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(455)
 <223> n = A,T,C or G

<400> 383
 actcttgaat acaagtttct gataccactg cactgtctga gaatttcctaa aactttaatg 60

```

aactaactgn cnncttcatg aaactgtcca ccaagatcaa gcagagaaaa taattaattt 120
catgggacta aatgaactaa tgaggataat attttcataa ttttttattt gaaattttgc 180
tganncttta aatgtcttgt ttcccagatt tcaggaaact ttttttcttt taagctatcc 240
acagcttata gcaatttgat aaaatatact tttgtgaaca aaaattgaga catttacatt 300
ttctccctat gtggtcgctc cagacttggn aaactattca tgaatattta tattgtatgg 360
taatatagtt attgcacaag ttcaataaaa atctgctctt tgtataacag aatacatttg 420
aaaacattgg ttatattacc aagactttga ctaga 455

```

<210> 384

<211> 376

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (376)

<223> n = A,T,C or G

<400> 384

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actcttgaat acaaggttct gatatcactg cactgtctga gaatttccaa aactttaatg 60
aactaactga cagcttcatg aaactgtcca ccaagatcaa gcagagaaaa taattaattt 120
catgggacta aatgaactaa tgaggataat attttcataa ttttttattt gaaattttgc 180
tgattcttta aatgtcttgt ttcccagatt tcaggaaact ttttttcttt ttaagctatc 240
cacagcttac agcaatttga taaaatatac ttttgngaac aaaaattgag acatttacat 300
tttctcccta tgtgggcgct ccagacttgg gaaactattc atgaatatat atattgnatg 360
ggaatatagc attgcc 376

```

<210> 385

<211> 422

<212> DNA

<213> Homo sapien

<400> 385

```

acctgtgggt ttattaccta tgggtttata tcttcaaata cgacattcta gtcaaagtct 60
tggtaatata accaatgttt tcaaagtgtat tctgtcatac aaagagcaga tttttattga 120
acttgtgcaa taactatatt accatacaat ataaatatct atgaatagtt tcccaagtct 180
ggagcgacca catagggaga aaatgtaaat gtctcaattt ttgttcacaa aagtatatat 240
tatcaaattg ctgtaagctg tggatagctt aaaagaaaaa aagtttcctg aaatctggga 300
aacaagacat ttaaagaatc agcaaaattt caaataaaaa attatgaaaa tattatcctc 360
attagttcat ttagtcccat gaaattaatt attttctctg cttgatcttg gtggacagtt 420
tc 422

```

<210> 386

<211> 313

<212> DNA

<213> Homo sapien

<400> 386

```

caagtaggtc tacaagacgc tacttccctt atcatagaag agcttatcac ctttcatgat 60
cacgcctcta taatcatttt ctttatctgc ttctagtcct tgtatgccct tttcctaaca 120
ctcacacaac aactaactaa tactaacatc tcagacgctc aggaaataga aaccgtctga 180
actatcctgc ccgccatcat cctagtcctc atgcctctcc catccctacg catcctttac 240
ataacagacg aggtcaacga tccctccctt accatcaaat caattggcca ccaatgggtac 300
tgaacctacg agt 313

```

<210> 387
<211> 236
<212> DNA
<213> Homo sapien

<400> 387
cgccctcata atcattttcc ttatctgctt cctagtcctg tatgcccttt tcctaact 60
cacaacaaaa ctaactaata ctaacatctc agacgctcag gaaatagaaa ccgtctgaac 120
tatcctgccc gccatcatcc tagtcctcat cgccctccca tccctacgca tcctttacat 180
aacagacgag gtcaacgata cctcccttac catcaaatca attggccacc aatggg 236

<210> 388
<211> 195
<212> DNA
<213> Homo sapien

<400> 388
acgccctttt cctaactctc acaacaaaaa taactaatac taacatctca gacgctcagg 60
aaatagaaac cgtctgaact atcctgcccg ccacatcctc agtcctcatc gccctcccat 120
ccctacgcat cctttacata acagacgagg tcaacgatcc ctcccttacc atcaaatcaa 180
ttggccacca atggg 195

<210> 389
<211> 183
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(183)
<223> n = A,T,C or G

<400> 389
taacactcac aacaaaaacta actaatacta nnatctcaga cgctcaggaa atagaaaccn 60
cctgaactat cctgcccgcc atcatcctag tctcatcgc cctcccatcc ctacncatcc 120
tttacataac agacgaggtc aacgatccct cccttaccat caaatcaatt ggccaccaat 180
ggg 183

<210> 390
<211> 473
<212> DNA
<213> Homo sapien

<400> 390
acaaagcagc aactgcaata ctcaaggtta aaacattaga aaagcatttg tgtgacagg 60
atattacagt attatcaaaa tattacattt tcagacttac ttagcagata atcatccacc 120
agagcttaaa tctttaaatt atttccatag tcttaaaaaa tatgtaattg cagaatgcat 180
ataaaaagaa tgtaaaagga aacctaaaat acaaatggaa taatgtaaca aataaatatt 240
tgatttcagt aactgttaat aatcagctca acaccaccat tctctctaaa ctcaatttaa 300
ttcttatagg aataatgaac tgtcaaatgc catggcataa ttattttatt ccaagctatc 360
atcaatgatt agaactaaaa aaaatttggc ataaaaaat cacaattcag cataaataaa 420
gctattttta gcttcaacac tagctagcat ctctaagaat tgttgaaata agt 473

<210> 391
<211> 216

<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(216)
<223> n = A,T,C or G

<400> 391
atttgatatt taggtttcct ttacattct tttatatgc nntctgacat tacatatttt 60
ttaagactat ggaaataatt taaagattta agctctggtg gatgattatc tgctaagtaa 120
gtctgaaaat gtaatatttt gataatactg taatatacct gtcacacaaa tgcttttcta 180
atgttttaac cttgagtatt gcagttgctg ctttgt 216

<210> 392
<211> 98
<212> DNA
<213> Homo sapien

<400> 392
acttatttca acaattctta gagatgctag ctagtgttga agctaaaaat agctttattt 60
atgctgaatt gtgatttttt tatgccaat ttttttaa 98

<210> 393
<211> 397
<212> DNA
<213> Homo sapien

<400> 393
tgccgatata ctctagatga agttttacat tgttgagcta ttgctgttct cttgggaact 60
gaactcactt tctcctgag gctttggatt tgacattgca ttgaccttt tatgtagtaa 120
ttgacatgtg ccagggaat gatgaatgag aatctacccc cagatccaag catcctgagc 180
aactcttgat tatccatatt gagtcaaatt gtaggcattt cctatcacct gtttccattc 240
aacaagagca ctacattcat ttagctaaac ggattccaaa gagtgaatt gcattgaccg 300
cgactaattt caaaatgctt tttattatta ttatttttta gacagtctca ctttgcgcc 360
caggccggag tgcagtgggt cgatctcaga tcagtg 397

<210> 394
<211> 373
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(373)
<223> n = A,T,C or G

<400> 394
ttacattgtt gagctattgc tgttctcttg ggaactgaac tcactttcct cctgaggctt 60
tggttttgac attgcatttg accttttatg tagtaattga catgtgccag ggcaatgatg 120
aatgagaatc taccgccaga tccaagcatc ctgagcaact cttgattatc catattgagt 180
caaatggtag gcatttccta tcacctgttt ccattcaaca agagcactac attcatttag 240
ctaaacggat tccaaagagt agaattgcat tgaccacgac tantttcaaa atgcttttta 300
ttattattat tttttagaca gtctcacttt gtcgccagg ccggagtgca gtggtgcgat 360
ctcagatcag tgt 373

<210> 395
 <211> 411
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(411)
 <223> n = A,T,C or G

<400> 395
 actgatcatt ctatttcccc ctctattgat cccacctcc aaatatctca tcaacaaccg 60
 actaatcacc acccaacaat gactaatcaa actaacctca aaacaaatga taaccataca 120
 caacactaaa ggacgaacct gatctcttat actagtatcc ttaatcattt ttattgccac 180
 aactaacctc ctcggaactc tgctcactc atttacacca accaccaat tatctataaa 240
 cctagccatg gccatcccct tatgagcggg cgcagtgatt ataggctttc gctctaagat 300
 taaaaatgcc ctagcccact tcttacngca aggcacacct acaccctta tcccatact 360
 agttattatc gaaaccatca gcctactcat tcaaccaata gccctggccg t 411

<210> 396
 <211> 411
 <212> DNA
 <213> Homo sapien

<400> 396
 actgatcatt ctatttcccc ctctattgat cccacctcc aaatatctca tcaacaaccg 60
 actaattacc acccaacaat gactaatcaa actaacctca aaacaaatga tagccataca 120
 caacactaaa ggacgaacct gatctcttat actagtatcc ttaatcattt ttattgccac 180
 aactaacctc ctcggaactc tgctcactc atttacacca accaccaac tatctataaa 240
 cctagccatg gccatcccct tatgagcggg cgcagtgatt ataggctttc gctctaagat 300
 taaaaatgcc ctagcccact tcttaccaca aggcacacct acaccctta tcccatact 360
 agttattatc gaaaccatca gcctactcat tcaaccaata gccctggccg t 411

<210> 397
 <211> 351
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(351)
 <223> n = A,T,C or G

<400> 397
 ngccgangta caaaaaaaag cacattccta gaaaaaggta ttggcaaata gtaaaaatgg 60
 gaggtcaaaa ncaaaaaaaaa aaaaaacaaa acnaaaaaaa gaaaaaacca acaattcttc 120
 aattcagtg gcaaacatta tataaaaaata gaaatactaa ctctacaggc agtatttcct 180
 gataaattat ttaaatagca tatctacnca atctgagata tctattccaa tggcaatgag 240
 aaaataattt ataaaaataa agcaatggta taccanatga tagaaaaaaa cataactttc 300
 agaaattgta tttaacattt caatgctatt tccttattgn gaatncttct c 351

<210> 398
 <211> 363
 <212> DNA

<213> Homo sapien

<400> 398

acaaaaaaaa	gcacattcct	agaaaaaggt	attggcaaat	agtaaaaatg	ggaggtcaaa	60
agcaaaaaaa	aaaaaaacaa	aacaaaaaaa	agaaaaaacc	aacaattctt	caattcagtg	120
tgcaaacatt	atataaaaaat	agaaatacta	actctacagg	cagtatttcc	tgataaatta	180
tttaaatagc	atatctacac	aatctgagat	atctattcca	atggcaatga	gaaaaataatt	240
tataaaaaata	aagcaatggg	ataccagatg	atagaaaaaa	acataacttt	cagaaattgt	300
atttaacatt	tcaatgctat	ttccttattg	ggaataacttc	tctgcagagt	ttttatgcta	360
tgt						363

<210> 399

<211> 360

<212> DNA

<213> Homo sapien

<400> 399

actgtttcct	cgtgggttcag	gggtgtgcat	gaaggctctt	aggagagcaa	acacctgttc	60
ctattctgta	tgtccctccc	tcatttcaaa	tgagagtaac	caattgagta	aaataaccaa	120
ataaccattg	ccccaccatg	aacatggggc	ttgggaagac	agtccctaca	tcttcatcat	180
atatttaggt	ttttaggcca	gccagctctt	tttttccaaa	gctttctttt	gaataccgcg	240
ccgggcgggc	cctaaggggc	aattctgcag	atatccatca	cactggcggc	cgctcgagca	300
tgcattctaga	gggcccattt	cgccctatag	tgagtctgat	tacaattcac	tggccgctcg	360

<210> 400

<211> 87

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(87)

<223> n = A,T,C or G

<400> 400

ctgcacatat	cnattacact	ggcggccgct	cgagcatgca	tgnagagggc	ccaattctcc	60
ctatattgag	tggaattaca	atnncnt				87

<210> 401

<211> 328

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(328)

<223> n = A,T,C or G

<400> 401

accagggac	acaaacactc	tgcctaggaa	aaccagagac	ctttgttcac	ttgtttatct	60
gctgaccttc	cttcactat	tgtcctatga	ccctgccaaa	tccccctctg	cgagaaacac	120
ccaagaatga	tcaataaaaa	ataaaataaa	attaaattaa	aaaaaaaaaa	agagaggaac	180
ccacaaaaaa	aaaaaaaaag	aaagtntata	aaataaaata	ttgaagtcct	ttccatttaa	240
aaaaaaaaaa	aagaaaaagc	acggactctt	tcattccagtt	ctgatgtgat	tatctctgga	300
aggcattttc	tcctcctctt	cctccccc				328

<210> 402
<211> 268
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(268)
<223> n = A,T,C or G

<400> 402
nacataatga caacatcttc actagactga gtgttcaagg atttgagatg attcgctatt 60
catcacaccc cgaagattga gatccactgt atttacacaa agcaaagcca tgtcagcaag 120
ggactgtcaa cctgattctg agaacataaa cattcaaaat ttattttcca gtgttccttt 180
ttggaaacca acaacacatc ttaataacct acacacacac acatctntac ctttaaaaaa 240
aaaaaaaaag tгнаaacttca cagatagt 268

<210> 403
<211> 538
<212> DNA
<213> Homo sapien

<400> 403
acagtgatag ctccccctgg gcaatacaat acaagaacag tgggttttgt caaatgggaa 60
caaggaaaca gaaccacaga aataaataca ttgggttaaca tcagattagt tcaggttact 120
tttttgtaaa agttaaaagta gaggggactt ctgtattatg ctaactcaag tagactggaa 180
tctcctgtgt tctttttttt tttaaattgg ttttaatttt tttaaattgg atctatcttc 240
ttccttaaca tttcagttgg agtatgtagc atttagcacc actggctcaa tgcgctcacc 300
taggtgagag tgtgaccaa tcttaaagca ttagtgctat tatcagttac caccatttgg 360
ggctttttatc cttcatgggt tatgatgttc tcctgatgac acatttctct gagttttgta 420
attccagcca aagagagacc attcactatt tgatggctgg ctgcatgcag acatttaaag 480
cttttagaga atacactaca ccaggaggta tgactactag tatgactatt aggagggt 538

<210> 404
<211> 310
<212> DNA
<213> Homo sapien

<400> 404
tttttttata gatacaattg gctttttattt gtgattcatg agtcagggca gtttccattc 60
tgcaaaatat agtgatagct cctactgggc aatacaacag tagaacagtg ggttttgtaa 120
aatgggaatc caggaacaga agaataataa taaattgatt taaataaact gattgggttaa 180
tttcagaata cttcatatta cttttttcta agagttaaag cagaaaggac tttcttactg 240
tgctgactca gacagcctgg actctcatgt ttttaggaaa attttgtctg ttctgggatc 300
tacctgcttc 310

<210> 405
<211> 559
<212> DNA
<213> Homo sapien

<400> 405
acaaatcaca attattaact cactggtagg gcagtgatga tcaaaccaat tgcattcatc 60
catgctgtaa tgttctctct tggcactaaa ggctgactgc agccggcaaa aaagaatgta 120

```

agtatgaatt tataaaaaaca ttttagatgg ctgacaacgg atcttatttt taaagaatat 180
gtctaattca gaggatcgac aactaatcca tttcaataaa acaatgggga atttttttatt 240
gaataaaaaat gtaatatgca taaaaactca agaaggcttt ttaaaaatac ttcctcccca 300
atcattatcc catacttcat gctaattttt aaaagaatct tgaaatcttg aaaacaagat 360
gaagagaatc ttgttttaag tgacaagtta acattattcc tatattaaat gtcaaactgc 420
tattaatgag tagaagtagg aacaaacccg gatcttagga tcctgtccag ggctcattcc 480
ataactccta taccacaaag acaagatctg gaaccagaaa acagtcacat tccaatgtgc 540
atcagccttg cggcaacag 559

```

```

<210> 406
<211> 427
<212> DNA
<213> Homo sapien

```

```

<400> 406
acaacagaat atctcgggaa tggactcaga agtatgccat gtgatgctac cttaaagtca 60
gaataacctg cattatagct ggaataaaact tttaaattact gttccttttt tgattttctt 120
atccggctgc tcccctatca gacctcatct tttttaattt tattttttgt ttacctccct 180
ccattcattc acatgctcat ctgagaagac ttaagttctt ccagctttgg acaataactg 240
cttttagaaa ctgtaaagta gttacaagag aacagttgcc caagactcag aattttttaa 300
aaaaaaaaatg gagcatgtgt attatgtggc caatgtcttc actctaactt ggttatgaga 360
ctaaaacat tcctcactgc tctaacatgc tgaagaaatc atctgagggg gagggagatg 420
gatgctc 427

```

```

<210> 407
<211> 419
<212> DNA
<213> Homo sapien

```

```

<400> 407
acaatttgta gttgtttcca ggtttggtta ataatcattc cttaacctag aattcagatg 60
atcctggaat taaggcaggc cagaggactg taatgataga attaaattag tgtcactaaa 120
aactgtccca aagtgtctgt tcctaataagg aattcattaa cctaaaacaa gatgttacta 180
ttatatcgat agactatgaa tgctatttct agaaaaagtc tagtgccaaa tttgtcttat 240
taaataaaaa caatgtagga gcagcttttc ttctagtttg atgtcattta agaattacta 300
acacagtggc agtggttaaat gaagatgctg tctacaaggt agataatata ctggttgata 360
ctcaaaacat ttttcatttt gtttaaagta gaagttacat aattctatat ttttaagtct 419

```

```

<210> 408
<211> 523
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(523)
<223> n = A,T,C or G

```

```

<400> 408
acatttgatg ttatgtgaat gttgagtttt tttcttctaa ttttcacttc agcagtgttt 60
agggttttca gatgccttat tccagtgtga acagaaaaag ttcatttttt atgtgggttaa 120
tgctttgatg tgtcacataa agagtgtttt gtagaaaatg ttggcacaat ttttaacttct 180
tagtggcttg tgacattata tattatatat atatgtatat atatctttat aacattcctg 240
tgttttagtag tgtaaatgtt ctgggcaagt ttttaatttt tgaatgcctt tggatattcc 300
agcaataaag gcatcatgtt ctgcaatagg atttcttact catttaccta ttttaacact 360

```

```

aaaatagacc acaactgagc acaaattcct tttataaatg ttatagaagc agggaagaat 420
aataaacaca tttgtgaatt gtggttcagt ttatttatct ttagggaagg ctgatcattt 480
atcttatagc acataacccc agcctcttat tcattatggn taa 523

```

<210> 409

<211> 191

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(191)

<223> n = A,T,C or G

<400> 409

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accccgtagt gatgagcact gactggttca ctggccacat tttagtctct cataataata 60
ggccacaaaa gggctctgtg gttgcctcc atgtgactg gcccctccc acccctaggg 120
ggcactcagt agctgctgag aaggcctgtc cactgangctg ttggaacccc ttcaataaat 180
acttagaagn a 191

```

<210> 410

<211> 403

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(403)

<223> n = A,T,C or G

<400> 410

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acactggcca gtgtgttttt ggcgattaaa cataatcctg tgaatcagat taattcactt 60
gctgagtgtt catttgccggc atccctctgt tgggtcttgg gggccctcca cgacctcgtg 120
gggctccccg tgggtccactc tgcccagagc ctgccttgaa attctgctga tatccatccc 180
gttgatagcc agagtaatcc cggggagcac tgaactgaga ctgtgtataa cactgtttg 240
gagtgttaga gaatgaaggg cggtaaccat catatcctcc tctgaatcca ttggcagggc 300
cccgtatcc attcatcaag cctctagcac cacgggagcc tccacgagac acaccacgac 360
tattgtaata gggctgattg ctacgtggaa atccagtgn ctg 403

```

<210> 411

<211> 384

<212> DNA

<213> Homo sapien

<400> 411

```

acgtgaaatc ataacaacat gttctcttgt gtttggttc tcttgctcag catgatattt 60
ttacggttca cccatattgc atgtatcagg aatataatcc tttttattat tgagtagtgt 120
tctattgtat gtatatacca cagtttattt ctcccttcac cctttgctag attttgggg 180
tttttcacat tgcgtattc aagtataaac ctgctctcaa cattcatgtg caagtctttg 240
agtggacata tatttgccgt ttctcttgag tgaatgcacc ttgttgggtc acgtggctta 300
atttaaaaaa attttaatca ctgtgtgca tatgtagtga ttattagtga ttatctcata 360
attttatttt cttgatgact aatg 384

```

<210> 412

<211> 315

<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(315)
<223> n = A,T,C or G

<400> 412
acaatatttc tcctttgaga agataggata tatgattttc ccaaaaatca caactttgaa 60
ggaagactta nttgctgact tcaattatat cctggaactg gcaacttggt cccttccttt 120
gtttcaaaaa aagtgtgaaga aagagtgata agatcaactt taatcattct tggatcttca 180
gcaaatccag gatcaatgta gaaaaacact ggcatatcta cttcctcttg gggattaagc 240
ctttgttctt caaaacagaa gcactgtatt ttattgaaat actgtccacc ttcaaattgga 300
acaatattgt atgna 315

<210> 413
<211> 554
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(554)
<223> n = A,T,C or G

<400> 413
acagggtttca ctattacaaa tatatgatgt taaactaaca aacctatgac cttcaaagat 60
gtcttcgtcc cagcacaca catttgtaat ttgtgtccat ttgtatttc cttcttcta 120
taatcttcaa attatatagt tatgcattga gttccctatg catctcacc atctccttta 180
ttcagcctt ctcatacttt gccattctct tctttctgga aataaccagc acaacaattc 240
cagcaacaac tgctatcacc acaaccacaa taacagcaat aacaccagct tttagaccct 300
gcattgagaa ttcaggtgct ttttcatcaa cataataaat taaagtttga ccaggatcca 360
gatccagttg ttccccattt actgtcaggt gccattttct tagaatgaaa caaggattca 420
cctttaacat ctttttcaaa ataataagcc acatcagcta tgtccacatc attctgagnt 480
ttttgagaag aattttgaac cagatcaata gtgataacat tattctcata caaaatactc 540
gngataaatt ntgg 554

<210> 414
<211> 267
<212> DNA
<213> Homo sapien

<400> 414
accagaaagg cacacgattt tacaatattt gttggaatta ccttactttt taacctcttc 60
atagcagttt tggtttgagt atattgatga aagccaaagt ctggtatcta aaacttgggc 120
caatgtttcc caactgggtat atgtcaggct ttcccaatag cttaactgtg accctatacg 180
gatggctttt tagatagttc tatactgctg tattgtgtta gcacttttct ttgtcattaa 240
caacacactt taaatgacat ttggtga 267

<210> 415
<211> 454
<212> DNA
<213> Homo sapien

<400> 415

accggaacct	gcagaaacag	tgtgagaaat	taagtcctgg	ttcactgcgc	agtagcaaag	60
atgggtcaagg	ccatggaaaa	agcagaaatt	taccaagaaa	gctgataccc	atgtatagtt	120
cccactcatc	tcaaatacat	ctgctatctt	tttaagctaa	gtcctagaca	tatcggggat	180
aacatggggg	ttgattagtg	accacagtta	tcagaagcag	agaaatgtaa	ttccatattt	240
tatttgaaac	ttattccata	ttttaattgg	atattgagtg	attgggttat	caaacaccca	300
caaactttta	ttttgttaaa	tttatatggc	tttgaaatag	aagtataagt	tgctaccatt	360
ttttgataac	attgaaagat	agtattttac	catctttaat	catcttgga	aatacaagtc	420
ctgtgaacaa	ccactctttc	acctagcagt	atga			454

<210> 416

<211> 370

<212> DNA

<213> Homo sapien

<400> 416

ccgacacggg	gccagcgccc	tgctgcgtgc	ccgccagcta	caatcccatg	gtgctcattc	60
aaaagaccga	taccgggggtg	tcgctccaga	cctatgatga	cttgtagcc	aaagactgcc	120
actgcatacg	agcagtcctg	gtccttcac	tggtcacctg	cgcggaggac	gcgacctcag	180
ttgtcctgcc	ctgtggaatg	ggctcaaggt	tcctgagaca	cccgattcct	gccccaacag	240
ctgtatttat	ataagtcctg	tatttattat	taatttattg	gggtgacctt	cttggggact	300
cgggggctgg	tctgatggaa	ctgtgtattt	atttaaaact	ctggtgataa	aaataaagct	360
gtctgaactg						370

<210> 417

<211> 463

<212> DNA

<213> Homo sapien

<400> 417

acactttata	tattccaaat	tgatcagata	tatggtttgc	aaattcatct	caatctgtag	60
cttatctttt	cctcttctta	aatcacaaat	ttttaaat	tgaagaagtc	caatatatca	120
gattttgtct	tttatggatg	tgctttcggg	gcaaagtcca	agaacttgct	acctagccca	180
agatcctgaa	gatttttctc	ctgtggcttt	tttcaaagtt	atctagtttt	atgtatcaca	240
tttaagtccg	ttatacattt	tgagttaaat	tttatataag	acgtgaggtt	taagtagagg	300
ttcttttttc	tcctcgcgat	gggtgtctaa	ttgctctagc	ataatttgct	agaaaggcta	360
ttcttcctcc	attgaattgc	tttttcaact	tttcaaaatc	agctgagcat	atttatatgg	420
gtttattttc	gggttctctc	atctgttcca	ttgacgtatg	tgt		463

<210> 418

<211> 334

<212> DNA

<213> Homo sapien

<400> 418

ttagcatttg	cttttatttt	tttactttga	tgctttttca	aattggcatg	tctttaaagt	60
atttttcttc	ctgattaaaa	atgtgtgtgt	atgtgtgtgt	gtgtgtgtat	atatatat	120
ttttaaatca	catttaatttt	accaagtga	accaagccat	actgtttttg	agccaattaa	180
gaaaattgcc	attttttaaag	tgtagcattt	cagggtaaaag	acccatgaaa	tggtcttgatg	240
tattctagac	tactgaaaga	aaaccacttc	aaagattttg	ttgaaagttt	tagtggtgtc	300
tgaaatgcaa	gaggggaagg	gattggtagt	gagt			334

<210> 419

<211> 297

<212> DNA

<213> Homo sapien

<400> 419

acttctttga ccaaggaata ccacagacac cctaccgata gaacagtggc tcagatctta	60
cttgctcctg cttacgaagt attcccaatc actggtcac tgaccctact tgaacactcc	120
tgaacagtca tgttttttaa aatcttcctt tatatcaagt cagagagtat acttctataa	180
atttctactca tggatgttag gaaatctagt catcttcctt gtgattgccc tgttaagtat	240
ttaaccatag ctatcatgtg tttcccaaat cttctctaga ttaaataatct tcagtta	297

<210> 420

<211> 418

<212> DNA

<213> Homo sapien

<400> 420

acgagaggaa ccgcaggttc agacatttgg tgtatgtcct atcaatagga gctgtatttg	60
ccatcatagg aggcttcatt cactgatttc cctatttctc aggctacacc ctagaccaaa	120
cctacgccaa aatccatttc gctatcatat tcatcggcgt aaatctaact ttcttcccac	180
aacactttct cggcctatcc ggaatgcccc gacgttactc ggactacccc gatacataca	240
ccacatgaaa tatectatca tctgtaggct catttcatttc tctaacagca gtaatatata	300
taattttcat gatttgagaa gccttcgctt cgaagcgaaa agtcctaata gtagaagaac	360
cctccataaa cctggagtga ctatatggat gccccccacc ctaccacaca ttcgaaga	418

<210> 421

<211> 304

<212> DNA

<213> Homo sapien

<400> 421

acgcctggac ccctgtgact tgcagcctat ctttgatgac atgctccact ttctaaatcc	60
tgaggagctg cgggtgattg aagagattcc ccaggctgag gacaaaactag accggctatt	120
cgaatttatt ggagtcaaga gccaggaagc cagccagacc ctccctggact ctgtttatag	180
ccatcttcct gacctgctgt agaacatagg gatactgcat tctggaaatt actcaattta	240
gtggcagggt ggttttttaa tttcttctg tttctgattt ttgttggttg ggggtgtgtg	300
gtgt	304

<210> 422

<211> 578

<212> DNA

<213> Homo sapien

<400> 422

actgtgcagg cagattcaca ggggtgggtg aagcatcca caatggctct ggcagcatca	60
ggatcacact tgaaggggct ctacagacaaa gttgtattca tgcaactgat tccttttcca	120
ttcgttttct tagtcaactaa tgctttccaa tgggtcatgag tgcttttaaat aatatcaatg	180
gcaaagtcct tatctttaaa ttctgcatta aacgcaaact cattttctgg ttttccatca	240
ggaaccttat accttctaaa ccagtcacaca gtagcttcta agtagccagg ttccagccgt	300
ttgacatcat tgatatcatt ataattggct gcatcaggat catccacatt aatggcaatg	360
actttccagt cggtttcccc ttctgcaatc atagccaata tgcctagaac tttcaattat	420
ttatttcacc tcttgacat accttgcttc caatttcaca cacatcaatt gggtcattgt	480
caccacaaca gccagtatgt ttatcattgt gccctgggtc ttcccaagtc tgaggggatg	540
caccatagtt ccagatatat cctttatacg ggaacaaa	578

<210> 423

<211> 327

<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(327)
<223> n = A,T,C or G

<400> 423

acagtatatt	tttagaaact	catttttcta	ctaaaacaaa	cacagtttac	tttagagaga	60
ctgcaataga	atcaaaat	gaaactgaaa	tctttgttta	aaagggttaa	gttgaggcaa	120
gaggaaagcc	ctttctctct	cttataaaaa	ggcacaacct	cattggggag	ctaagctagg	180
tcattgtcat	ggtgaagaag	agaagcatcg	tttttatatt	taggaaattt	taaaagatga	240
tggaaagcac	atthagcttg	gtctgaggca	ggttctgttg	gggcagtgtt	aatggaaagg	300
gctcactgnt	gntactacta	gaaaaat				327

<210> 424
<211> 384
<212> DNA
<213> Homo sapien

<400> 424

acgaaaaata	aatctcctta	aaaactaaat	aaaatgcact	gtattcttac	agttaatggt	60
tataactata	gtaaaaaatt	aatatatatc	ctattacata	aatgttat	cttaggtggt	120
ccattaagaa	gagcaataga	ataatgctaa	aaaataatgc	ctataaatct	tcagagtata	180
aagacatcca	ttcagaaaca	aaaattagca	ctaaat	tataaaatag	accagatgac	240
aaaatttatt	ttatttttaa	acagtgggtt	tgacacaaat	tatgttattg	aaaagcatta	300
ttaatgttta	atttatttaa	aattttggaa	tttgccattt	ctcagagaa	gatcaggcct	360
taggaaatta	atacagtagt	agta				384

<210> 425
<211> 255
<212> DNA
<213> Homo sapien

<400> 425

actatcaggc	tttgtgctga	tttctgaac	aaactgcatt	atattatgaa	aacaaaagga	60
aaagaagaaa	taataaaaac	tatactccca	tatttcactt	acagtgtttg	agttcctgga	120
aggacctata	taatggaggc	agcattcaaa	caagaaatta	tgccaatcaa	ctgtcaaatt	180
ttcactataa	ttttcctaaa	aaggcgtttt	tcccccaata	tctattaatc	tcaaagaaac	240
ataagttgtg	aatgt					255

<210> 426
<211> 196
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(196)
<223> n = A,T,C or G

<400> 426

acatgaantn	nccaggccca	cacagccaga	cagcaacaga	accaagacct	agggctcttc	60
actcctgtta	catcacacca	tggcaatgat	tttacattct	ccaactgatt	caaatcatat	120

ggcagctagg gatttggggg ctccatgttt tatttcaatt gcaagttcaa gatttctttt 180
 tatctttgtg ggctga 196

<210> 427
 <211> 163
 <212> DNA
 <213> Homo sapien

<400> 427
 acagaagatc catggaggca agtgctgtca ggaaggacac tgcttccctc caccctccca 60
 aatgtcacca ccaagttcct tcaggtgaga cctcacacaa tgtcaagtgc tttctaggaa 120
 atactaagat caggttgaga gattctgctt ggtctagtca atc 163

<210> 428
 <211> 315
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1) ... (315)
 <223> n = A,T,C or G

<400> 428
 nactgagtan agatgctggg gaatgtgcaa tatgccttga agaattgcag cagggagata 60
 ctatagcacg actgccttgt ctatgcatat atcataaagg ctgcatagat gaatggtttg 120
 aagtaaatag atcttgccct gagcacctt cagattaagc gtcagcttcc tgttttatag 180
 gttttcttgt cttgacaaga tgcttgaaaa accaagagga tatgaaaatc tgtctctgga 240
 gaaacaaaga cgcaggcata ctcagccaga aatctgagtt ttgtgagact tggtaatata 300
 gagatggaca atcgt 315

<210> 429
 <211> 131
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1) ... (131)
 <223> n = A,T,C or G

<400> 429
 acagtttaggn actagaacat ttgttaagcc tcccaaagta gngtgcattg aagattctag 60
 agtgtccagc tcttgacta caaatgtaat aataacagaa taaatacact taccctgatg 120
 atattgaggg t 131

<210> 430
 <211> 503
 <212> DNA
 <213> Homo sapien

<400> 430
 actgattttt aataaaaagaa ataaggttca aagtttagca caacaacaca gcaataagaa 60
 gctgacaact tggataaaaa tacaagaaag taacacagag ccagggtac ccattattta 120
 ctgtgtgcat acaggaatgc tatacttcag atgtataaat tagagactga ttttaagtta 180

ttaatttaac	tactttttgt	ccactgtgct	aaactaaatt	ttataactaat	gtgctactgc	240
gtaaacactt	caaagcaatc	ttcattaaaa	tgctgcaaag	aaaaacaaga	atacacatca	300
tccaaaacta	aggatgtcat	tgcatgtcac	agtttgtata	ataaatacc	tccctttcaa	360
tcactactaa	gatcactaca	tcctatctac	tcacagcac	aaccttgaag	caacttatac	420
ttacaaatat	tagcaatgca	gccaaacatt	tgttttttgc	aaagcaacta	gtaaaaatca	480
agaattttta	ttaagacggt	gca				503

<210> 431

<211> 207

<212> DNA

<213> Homo sapien

<400> 431

acaagtgtgg	cctcatcaag	cctgcccag	ccaactactt	tgcgttttaa	atctgcagtg	60
gggcccga	cgctgtgggc	cctactatgt	gctttgaaga	ccgcatgac	atgagtcctg	120
tgaaaaacaa	tgtgggcaga	ggcctaaaca	tcgccctggt	gaatggaacc	acgggagctg	180
tgctgggaca	gaaggcattt	gacatgt				207

<210> 432

<211> 485

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(485)

<223> n = A,T,C or G

<400> 432

aaaaaaagta	atggaaaaat	ggttgcaggt	ttaatcncaa	aangaactta	atthtngtng	60
atthtngtng	atctgctaaa	acactaatat	ctataaatat	gaactgacag	catcgttcta	120
aatttacttc	tgaagagctg	tcgagacttc	aataaaatat	aagcaagtta	ctggatcata	180
tttatggact	gctgaattaa	ctacccgaaa	agtatcagtt	actttcaaag	aacacaaaac	240
aaagtgaacg	tggaaaaaag	ccttcctttgc	aaaagtcctt	ttattagtc	tatcctctaa	300
aattccaagc	cacagagcct	tgatattcct	ggattctggt	ttaagtaacc	ttagttttta	360
atatgacact	tgggatatgc	acaatgggaa	agggtaggat	atgtgaacaa	aatttaattt	420
ctttttttcca	aaggnagnca	ttttctttta	atncatccta	tccacttttg	cccacttccc	480
catgt						485

<210> 433

<211> 280

<212> DNA

<213> Homo sapien

<400> 433

actgtcacta	caatattaca	ttctgcaa	gttattctgt	tgtatcagat	acaaaatttt	60
agtgaggtat	ctctaaggca	catagtagaa	aacaaaattg	gttaattact	caagttcctt	120
tcactgtgat	ttggaaatga	tttaattctt	atagaatgag	aacctttttt	ggactagctt	180
ttttattaaa	atgggtcaat	ttgtgttgat	aaggattgca	ttaatattta	atagtgtctg	240
cttttcctct	gggcacacca	ttttgatcat	taaccagagt			280

<210> 434

<211> 234

<212> DNA

<213> Homo sapien

<400> 434

ctttgctgcg	catcagggtgc	tttaagcttc	ggaacaactg	tgcaggattc	tattttagta	60
ttctggaagc	atcattgagg	aagtagtcca	gtgaagttag	ctctaaaaaa	actctttact	120
ctaacaatta	aaagaaatat	gcaaaggat	ccataaggga	tgaataaatt	attaaactat	180
taagaagttg	ctataaatat	gcagtgttaa	ttcaataatt	cataacggac	tggt	234

<210> 435

<211> 330

<212> DNA

<213> Homo sapien

<400> 435

acctcccgtg	tcaccagttc	ccacagaagc	actgcaaaac	tccacatgtc	tgctgagcgt	60
ctgtttgtgt	cttcaggctt	cttctgcaga	gcttcggggg	ctaccaggc	agggtgcatac	120
atgcgaccag	gacattggaa	agagaacttg	acatcagcca	tgctaattcg	ggcagtcatg	180
tcctcatcaa	tcattacact	acggctattg	agtgcattgc	gtgggatgag	gggctctagt	240
gtgtgtagga	aagccatgcc	ccttgccatg	tccaaagcaa	acttcacagc	ctggctctgg	300
tccacgacga	aattgggtgcc	ttcatgtagt				330

<210> 436

<211> 311

<212> DNA

<213> Homo sapien

<400> 436

acaactttac	aatggaattg	tatttcaatg	attattttga	tatcagatta	aaccttccaa	60
aaagttacac	ataattcagg	tctatttttt	ctaccagtaa	gagttctgct	aaattacaaa	120
accccataat	cacagtgttc	agttttttaa	aaattaaaca	cacagtaatc	ctgtcaatgt	180
taatcaaaat	caaaacttcg	gaatgccgtg	gcatttatgt	gaccaatctg	agtttttagat	240
acaaatacca	gctgtttatc	ccatgaacca	tttttcctag	gctgaggctg	tgaaaaatcg	300
aaagtcggcg	t					311

<210> 437

<211> 355

<212> DNA

<213> Homo sapien

<400> 437

actagtggat	gggggtcagg	gtgtcactcc	aaggccctct	acagaccag	agaagaggaa	60
agtcaaaaaa	gccagatatg	agactgctga	agtgggtgta	agaaatatag	gcaaggtaaa	120
gggaacaaga	tctgggctcc	ctcctacttg	tgccctcac	tggaacctag	acaccctacc	180
tctaagactg	gttcttagaa	ggctgaacag	taaggagcat	tccaatagct	tctgaaactc	240
ccaaggctgt	ttcaagtagt	cgaaagccat	ccctggactg	ttcagggtgcc	ttttctattt	300
cccacctgag	ctctctgccc	tttcttttag	cctcacaggt	ttccagaatt	acagt	355

<210> 438

<211> 431

<212> DNA

<213> Homo sapien

<400> 438

acagtaactt	taactttaca	tagagctgag	ataaaaaata	agctttctta	caaattacat	60
tttttttcca	gtgaattact	tttgagtaa	aaatagctgc	tacataaatc	cctcctgac	120
tctgaaaagg	agttgcatat	ttccaaaaat	aatattctta	ttttaatcac	acagaagaac	180

gtggagcaca	ggaaggaaat	ggctgggtgg	tcagagagag	gtgagctgtc	ggagaaacac	240
agttaacta	aaaaataaaa	tccattttgt	gtataaactg	acttaaacgc	atgcaaagaa	300
gtggaaaaca	tatgccattt	gtcaagaaaa	atactgtctt	atagctttta	ctttacaatt	360
aaaggagaaa	gcagaggcca	gatataagcc	cagataataa	catttaagtt	tctcataaaa	420
ctcccaaagt	t					431

<210> 439

<211> 170

<212> DNA

<213> Homo sapien

<400> 439

actgtcataa	aaaacagtgg	agctctgtat	tagaaagccc	ctcagaactg	ggaaggccag	60
gtaactctag	ttacacagaa	actgtgacta	aagtctatga	aactgattac	aacagactgt	120
aagaatcaaa	gtcaactgac	atctatgcta	catattatta	tatagtttgt		170

<210> 440

<211> 400

<212> DNA

<213> Homo sapien

<400> 440

acgtaaaaag	aacatccttc	ccatcttcaa	ggtcaagatt	gaacgctgac	tccctgcagga	60
agtcttccag	gattcccagg	caggaatgat	ggctccctgt	ccctgtagct	ccaggagtgc	120
ttgcttcacg	cacgcctcac	ataccagact	gaatgttygc	aggaggagtg	accaggtcgg	180
tcatctgtgt	ccctaaccac	tacaacaggc	cagcaatcta	cccgtgtgtg	tttggtggac	240
agaattaacc	atgatgggcg	gccgagggcg	cctggagcta	tttgggggct	tggagagAAC	300
ctcttaggag	agtgtcaggc	tctaggccag	tgtcaccaga	ggaggtcagt	ctcagtcctt	360
ggagtgggtg	gatggaaacc	agacgggact	ggcatggtcc			400

<210> 441

<211> 204

<212> DNA

<213> Homo sapien

<400> 441

acctagttaC	ttcttaagat	cagggtgtata	aaactgtgga	gtggagcggg	atgggtatgga	60
atgacttgga	atgtaagctg	tcaggggagaa	aatgttggtta	cacttttgct	aagatctggg	120
ggtttcttca	tattcctgct	gttggaagca	gttgaccaga	aatgcttgcc	agtactgcca	180
aagcactgct	gtgaaatgtg	aagt				204

<210> 442

<211> 649

<212> DNA

<213> Homo sapien

<400> 442

acattttaatt	ttttacaaca	ttttctccct	agagatataa	tttagatatt	cctatcttca	60
aagtaaaaa	caaaaatagga	aataagcata	gaaacagcct	attggcagtg	gttacacctg	120
catgggtattt	atgagtctcc	aaactatttg	aaatttattt	caaccaaggt	tctcttaagt	180
cttcattact	tgggtgtaac	tcgagagaaa	actaatttat	atcaatttac	agtttagtgg	240
tcatgatcag	gggaaagtga	tactcttcca	ctgactacaa	gtcattgcag	aggcagttta	300
gaacttttcc	tttattccta	atatacagga	caaaccttgc	cgacatctca	ctacctcaaa	360
aatcaaat	aaatgaagta	tccaggagta	gcctaaaagaa	tgagtgtaat	ctggatggat	420
tttagtctaa	atttatgcct	tgctcttcag	taaagtatag	taactccaga	tatatgttcc	480

acagatgcaa taatttctgt tccttggtcg gtgcagaata taatttatac ttcctgaaat	540
caactttgtc tattcatgaa aatagctgct ttttatttgc ctttgtctca ctttgaatat	600
atatgatcca caggttacag acttttccaa taactacatt tcaacttgt	649

<210> 443

<211> 346

<212> DNA

<213> Homo sapien

<400> 443

acgtgggatt gaaatgcaca tacatgtttt tgctaagagc acatacattt cattctcctc	60
actttgttca taacctcagc attgtcagat aacctcagtg agttaactca aagcctttta	120
ttatggaaag aactggcaca gttacatttg ccagtggcaa catccttaaa aattaataac	180
tgatgggtca cggacagatt tttgacctag ttcctttttc ttttagagca aaaagaactt	240
ttacctcggc atccagccca acccctaaag actgacaata tccttcaagc tcctttgaaa	300
gcacctaaa cagccatttc cattttaata gttggatgcg gattgt	346

<210> 444

<211> 425

<212> DNA

<213> Homo sapien

<400> 444

accaatttcc ttttacagta aaggggcttt tectgttget tgttgaaccg gttcccagct	60
gcccattacc accaagccca aaagagtaaa ttctgtcctg tgaaggaaca aaagcagaag	120
tgtgctgccg tccacaagca atctcagtga caatgcttcc cataagttca aaaactttcc	180
ttgggtttat ttcattgactg gttagaattat ggcccaactg accataccct ccagctccaa	240
aagtaaacac tccaccttcc ttgggttagag cagcagtatg atcttctcca caacaaatat	300
aaactatttt ctgagatctt agtgacttta gtaaattagg aacataccta tcattttcat	360
cattaagacc tagctgacca aacttggtgc gtcccatcc aaagatagct ccagaaaggg	420
tgagt	425

<210> 445

<211> 210

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (210)

<223> n = A,T,C or G

<400> 445

nactgtccca atataaaaca gtaattattt gacctttgca ctgtttgtct ggctcttttc	60
agtttgattg catataaatg tggaacttga tagatctcta tatttttaat gcacttgatga	120
taaaactggca gcagggttag acattacttt caaagcttga ggtagaccga gtcagcatgc	180
tagacagget tctctctcta accaaaactg	210

<210> 446

<211> 326

<212> DNA

<213> Homo sapien

<400> 446

tcgaaagacc cctgtaaaag agcccaacag tgaaaatgta gatatcagca gtggaggagg	60
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```

cgtgacaggc tggaagagca aatgctgctg agcattctcc tgttccatca gttgccatcc 120
actaccccggt tttctcttct tgctgcaaaa taaaccaactc tgcccatttt taactctaaa 180
cagatatttt tgtttctcat cttaactatc caagccacct attttatattg ttctttcatc 240
tgtgactgct tgctgacttt atcataattt tcttcaaaca aaaaaatgta tagaaaaatc 300
atgtctgtga gttcattttt aaatgt 326

```

<210> 447

<211> 304

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (304)

<223> n = A,T,C or G

<400> 447

```

nntcnaggt acatgctaga agtctgatgt ngtnngtaac acagaaacat acacagtctt 60
catattcaaa gtcttcacng ggatgtcggt ctgtaatttc ctgctgttgg gtctcttcca 120
gaaacagctt tagcttcctg ctccgaaggc caaacacctt ggctgcttca tacagaagac 180
cttggtgggt gagtccattc tgcccaagtg ggttttcaag caggagaagt cccactgtcc 240
ccattaaaca ctcttggtggc tttgcattca ggagctgtag gttgatatac tgacaaggaa 300
gagt 304

```

<210> 448

<211> 203

<212> DNA

<213> Homo sapien

<400> 448

```

acatgaaagc ggcaatgcgg taaaaagcga attcttacct aaggtcagaa ttttttatta 60
agcgcatttt cattagttgg acaaaacaacc ttataaacc ttatgtcaaa ccatataatg 120
tgaagaatct ccatgggaga gatttttttt cacccttcag aattatcttt ttcccctaag 180
accttcatat gaatcttctt tgt 203

```

<210> 449

<211> 481

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (481)

<223> n = A,T,C or G

<400> 449

```

acttgttcta taatactctg atgtttcctt aaattcctga acaacattct gtttactaaa 60
tttcttttct tcctttattc acaccaaat ccaccctata atagaagcta attatttcag 120
aaagcttttt agtgatcatt tattactttg tgtttactag atattaattc taagatgaat 180
tccttttagaa ttttagaaaa aattattcta gacaacaatc aaagtaaagg atacatccag 240
cattgaaacc ataagccggc aagtctccag gttaaaagg tttgatcctc cagcaatgcc 300
agactgtgtc agacatctct gcaattcatc agcatctatc tgccatcct gtccagctac 360
agcagcaaag taaccataca gcggatcctg agtttgtccg ggaaacgcag gccctccggg 420
agccctcca tactgcatct tgagttgaag tcttatangt agaagctggg gatccttaga 480
g 481

```


<210> 450
 <211> 296
 <212> DNA
 <213> Homo sapien

<400> 450
 acatggttta atacaacaac aaaaaaattt aatcaagtga aacgtaataa actgaacaat 60
 aaacactcaa aacattttcc attggaaaca tgtaaagaca atatgagggtt ttgttaccat 120
 cttactgcaa ttttcttatg tgttactagt ctacataccc catgttttct gtaatcatgc 180
 agatgtgaat ggaagtttga atgattaaat aaatgaaaag tccgtttact gcaggggaatc 240
 atttcacaag gcagccaaac cgggttttaga gaacaaaact attcaagaaa ttctcc 296

<210> 451
 <211> 294
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(294)
 <223> n = A,T,C or G

<400> 451
 acatgntcca aggcaacggn ctgtgaactt cctctgagtg aaggcatccc ctccagcacc 60
 ttccagcctg ctagtttagga cgaccgcgcg ccaccctcca ggacctccag ccctgcactg 120
 cctttcctct cttttaaata attcttcatt gagttctaata atgtaaaaaa aaagtttact 180
 gtaaagtgtg caaataanga aatttttttt aaaagtcctc agtaatctta ccagtaacaa 240
 ttgttatggg cacatttgct tttggaagat ttcttttgta tgcattgggat aagt 294

<210> 452
 <211> 129
 <212> DNA
 <213> Homo sapien

<400> 452
 acttttagat cacaaatttg cctttaagta acacataata cacttaaggc agatttgctt 60
 tacagggtgc ctcagcttct aaacaccact acactgcttt atataaaaaa caaaaatcac 120
 atagaagag 129

<210> 453
 <211> 151
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(151)
 <223> n = A,T,C or G

<400> 453
 actctcaann tgtatttagg tgccaacaca tttaggatca ttgnngnttc tcagtgaatt 60
 gaccttttta tgagaataaa atgtctattt ctgaaatgtc cctatttctg gaaatgttcc 120
 ttatactaaa gtccaacttg tgtggattan t 151

<210> 454
 <211> 119
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(119)
 <223> n = A,T,C or G

<400> 454
 tgctgatgna gcatgctttt taaatccttt aaaaacactc accatataaa cttgcatttg 60
 agcttggtgtg ttcttttgtt aatgtgtaga gttctccttt ctcgaaattg ccagtgtgt 119

<210> 455
 <211> 515
 <212> DNA
 <213> Homo sapien

<400> 455
 accttataaa gttccttttc atccttctct gtcttcaact gacattcaag ttgttctctt 60
 tcatgtgtg ccttcttgag ttgggccttt aaactgtcta attcggtttc tttttcaatt 120
 gctttatgtg ttactgacac aatatcttcc tcaagctgat gggctttgga tgtagcatca 180
 ctgaacctct tcttaaacctc ttcattttcc atttttaagc ttgtgtttac ttcagtaaga 240
 cccttttgtt ctgcttgacg ttggtcacat ctttctttct catgggtlaag ttctctttcc 300
 attctcccaa cttgttctcg aagttgtgct gtttcttttt ccagaacggc aattaacttt 360
 aacagtctct cttttctttt catgggtttc tcaattttca actcaagaag gcctgctttt 420
 gtggtcacca ctaacatgtc agaatttctt tcattctcca tagtaagcag ctcttcaact 480
 ggagaagaag ctcgaaactg gaaaggtgta cctgc 515

<210> 456
 <211> 350
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(350)
 <223> n = A,T,C or G

<400> 456
 actcccctcc ccaaataaga acctcaaaga ctgateccatt tcccctaggg cctggggccag 60
 gagtagctca ctgctcactg ctgaggagaa aggcacaaga tataatgtca taagagcagg 120
 acagtggctc agcctacaga gttccctata ggggaaagaa ggcaggaaat aggcgcaggg 180
 tctggctcctg tccttgcacc accctgagca gctagtcttg ggaagggatt acaggccctg 240
 ggccataggg tgctcgccat tctgctttcc tatectgttt ctctccctgt gctgctccct 300
 tttagccagn gctgagaaat gttcancacc tgaggcaaaa ctgccatagt 350

<210> 457
 <211> 293
 <212> DNA
 <213> Homo sapien

<400> 457
 gcaggggcaa cagtcacagc agccctgacc agagcattcc tggagctcaa gctcctctac 60

```

aaagaggtgg acagagaaga cagcagagac catgggaccc ccctcagccc ctccctgcag      120
attgcatgtc ccctggaagg aggtcctgct cacagcctca cttctaacct tctggaaccc      180
accaccact gccaaagctca ctattgaatc cagccattc aatgtcgag aggggaagga      240
ggttcttcta ctcgcccaca acctgcccc gaatcgtatt ggttacagct ggt          293

```

<210> 458

<211> 500

<212> DNA

<213> Homo sapien

<400> 458

```

actagactcc agattaccct ttcttaataa atatctcagg gtaaggaaag aaagaaactg      60
tatagatata tttaaaatag agaatacttt ccaagcaata catgatgcct ttcctaaaag      120
actctaaaag aaaaagattc tgtaactctc ttttagcacc aaattattgt ttatcttgct      180
ggatattttta tatgaacagt gttaatttag atgcactaaa gcaaaggtag gcaaactaca      240
accatgagtc aaacatggcc acaccattc atttgcatt gtctaagctg gttttgact      300
acaactgcag agttgaatag atgcagcaga tcctttacag aaaaagtgtt ctgacctcaa      360
ttctaaagta attgtagtag ggagctggag gactttcttt ccctttatgg taattttttg      420
agctacaaaa agagccttgc agaaatgggt gaagggatta atctttttaa aataaatgct      480
atatattagg aaaataaaaa

```

<210> 459

<211> 394

<212> DNA

<213> Homo sapien

<400> 459

```

ggtgaaaaga cttgatTTTT tgaaaggatt gtttatcaaa cacaattcta atctcttctc      60
ttatgtattt ttgtgcacta ggcgcagttg tyttagcagtt gagtaatgct ggtagctgt      120
taagggtggcg tgttgacgtg cagagtgtt ggctgtttcc tgttttctcc cgattgctcc      180
tgtgtaaaga tgcttgtcg tgcagaaaca aatggctgtc cagtttatta aaatgcctga      240
caactgcact tccagtcacc cgggccttgc atataaataa cggagcatac agtgagcaca      300
tctagctgat gataaataca ctttttttcc cctcttcccc ctaaaaatgg taaatctgat      360
catatctaca tgtatgaact taacatggaa aatg

```

<210> 460

<211> 279

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (279)

<223> n = A,T,C or G

<400> 460

```

actnccgatt gaagcccca ttcgtataat aattacatca caagacgtct tgcactcatg      60
agctgtcccc acattaggct taaaaacaga tgcaattccc ggacgtctaa accaaaccac      120
tttcaccgct acacgaccgg ggggtatacta cggatcaatgc tctgaaatct gtggagcaaa      180
ccacagtttc atgccatcg tcctagaatt aattccccca aaaatctttg aaatagggcc      240
cgtatttacc ctatagcacc ccctctagag caaaaaaaa

```

<210> 461

<211> 278

<212> DNA

<213> Homo sapien

<400> 461

tttggacact	aggaaaaaac	cttgtagaga	gagtaaaaaa	tttaacaccc	atagtaggcc	60
taaaagcagc	caccaattaa	gaaagcggtc	aagctcaaca	cccactacct	aaaaaatccc	120
aaacatataa	ctgaactcct	cacaccaat	tggaccaatc	tatcaccta	tagaagaact	180
aatgttagta	taaagtaaca	tgaaaacatt	ctcctccgca	taagcctgcg	tcagattaaa	240
acactggact	gacaattaac	agccaatatc	tacaatca			278

<210> 462

<211> 556

<212> DNA

<213> Homo sapiens

<400> 462

aacgtccaag	ggggccacat	cgatgatggg	caggcgggag	gtcttggtgg	ttttgtattc	60
aatcactgtc	ttgcccag	ctccggtgtg	actcgtgcag	ccatcgacag	tgacgctgta	120
ggtgaagcgg	ctgttgccct	cggcgcggtat	ctcgatctcg	ttggagccct	ggaggagcag	180
ggccttcttg	aggttgccag	tctgctggtc	catgtaggcc	acgctgttct	tgacgtggta	240
ggtgatgttc	tgaggagcct	cgggtggacat	caggcgacag	aaggtcagct	ggatggccac	300
atcggcaggg	tcggagccct	ggccgccata	ctcgaactgg	aatccatcgg	tcatgctctc	360
gccgaaccgg	acatgcctct	tgtccttggg	gttcttgcgt	atgtaccagt	tcttctgggc	420
cacactgggc	tgagtggggt	acacgcaggt	ctcaccagtc	tccatgttgc	agaagacttt	480
gatggcatcc	aggttgacgc	cttggttggg	gtcaatccag	tactctccac	tcttccagtc	540
agagtggcac	atcttg					556

<210> 463

<211> 659

<212> DNA

<213> Homo sapiens

<400> 463

cacactgtgc	ccttccagtt	gctggcccgg	tacaaaggcc	tgaacctcac	cgaggatacc	60
tacaagcccc	ggatttacac	ctcgcccacc	tggagtgcct	ttgtgacaga	cagttcctgg	120
agtgcacgga	agtcacaact	ggtctatcag	tccagacggg	ggccttttgt	caaataattct	180
tctgattact	tccaagcccc	ctctgactac	agatactacc	cctaccagtc	cttccagact	240
ccacaacacc	ccagcttccct	cttccaggac	aagagggtgt	cctgggtccct	ggtctacctc	300
cccaccatcc	agagctgctg	gaactacggc	ttctcctgct	cctcggacga	gtccctgtc	360
ctgggcctca	ccaagtcttg	cggctcagat	cgcaccattg	cctacgaaaa	caaagccctg	420
atgctctgcg	aagggctcct	cgtgycagac	gtcaccgatt	tcgagggtcg	gaaggctgcg	480
attcccagtg	ccctggacac	caacagctcg	aagagcacct	cctccttccc	ctgcccggga	540
gggcacttca	acggcttccg	cacggtcatc	cgccccttct	acctgaccaa	ctcctcaggt	600
gtggactaga	cggcgtggcc	caagggtggg	gagaaccgga	gaaccccagg	acgccctca	659

<210> 464

<211> 695

<212> DNA

<213> Homo sapiens

<400> 464

accttcattt	gaccccatca	gcttcagggc	cttctttaca	tttccactgg	cctgatccat	60
gtatgcaatg	ctatttttgc	agtgatatgt	gatgttctgg	gaagctcggc	tggagagaag	120
tcgaaggaat	gccagctgca	catcaaggac	atcttcagga	agttcaggat	tgccgtagct	180
aaactgaaaa	ccaccatcca	tggactctcc	aaacaaaacg	tgtttcttct	cagcactaga	240
atctgtccac	cagtgtttcc	gtggaacatt	caaaggattg	gcacttatgc	atgtttcccc	300

```

agtttccata ttacagaata ccttgatagc atccaatttg catccttggt tagggccaac 360
ccagtattct ccactcttga gttcaggatg gcagaatttc aggtctctgc agtttctagc 420
gggggtttta cgagaacat caggactaat gaggtcttct atttgccat taacagactt 480
gagtgaagtc ataatctcat cgggtgtgat tttgaaatcc attggttcat ctccataata 540
cggggcaaaa ccgccagctt tttcacctcc aatcccagca atggcagcgg ctccaacacc 600
accacagcaa ggaccagggg caccaggagg tccaggaggg cctggttgcc ctgggtggcc 660
tggggagccc tcagatctc tttcacctct gttac 695

```

<210> 465

<211> 73

<212> DNA

<213> Homo sapiens

<400> 465

```

caggtccaga gctcccaggt ttccagggtt cagtcctctc agtcccagag ctcccagggt 60
ttcgggtttcc agt 73

```

<210> 466

<211> 507

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(507)

<223> n = A,T,C or G

<400> 466

```

agcactggca gaggnagcca aatatagtga tgtgcgccag agataagtat tctcctctcc 60
aagcatattg ctatacaaga ctttaaagac ttcataaaaag ccaaacttgc agagtccctg 120
catggagtag ccaaggaaag tcggagccca tccttttagcc aaaccacgaa caccatcctc 180
tttaagtgtg actgagaatc cgttaaatat gcccttgtac ttttgggggg ccacctgcat 240
acggcatttc actaaatcca ggggaaccac agcagtgtgt gtcagaccac aacttaagac 300
cccaccaaag ccacacagtg cataataactt cgcggagcca aattcacaac tgtactcttc 360
cacggcggcg gctgccaggt tgcgagggcg gcggggctgg cccgtggggc ctggggagct 420
gctgcggagg tccccgagac catcgtgcac canctgcaga tgtggcgtgt tgaaggggtt 480
cgcccgcgcc aggtgcgcca cggacga 507

```

<210> 467

<211> 183

<212> DNA

<213> Homo sapiens

<400> 467

```

cctcatgagc taccgggcca gctctgtact gaggtccacc gtctttgtag gggcctacac 60
cttctgagga gcaggaggga gccaccctcc ctgcagctac cctagctgag gagcctgttg 120
tgaggggcag aatgagaaaag gcaataaagg gagaaagaaa aaaaaaaaaa aaaagggcgg 180
ccg 183

```

<210> 468

<211> 129

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature
 <222> (1)...(129)
 <223> n = A,T,C or G

<400> 468
 gcggccgcgt cgaccggcgc cgtcggggcnc cggggccgggc catggagctg tggacgtgtc 60
 tggccgcggc gctgctgttg ntgntgctgn tgggtgcagtt gagccgcncn gccgagttct 120
 acnccaang 129

<210> 469
 <211> 243
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(243)
 <223> n = A,T,C or G

<400> 469
 gcggccgcgt cgacnnggcca tgggagactgt ggcacagtag actgtagtgt gaggtcgcg 60
 ggggcagtggt ccatggaggc cgtgctgaac gagctggtgt ctgtggagga cctgctgaag 120
 ttgaaaaga aatttcagtc tgagaaggca gcaggctcgg tgtccaagag caccgagttt 180
 gagtacgect ggtgcctggt gcggagcaag tacaatgatg acatccgtaa aggcacgtg 240
 ctg 243

<210> 470
 <211> 452
 <212> DNA
 <213> Homo sapiens

<400> 470
 cctcaagtac gtccggcctg gtggtgggtt cgagcccaac ttcattgctct tcgagaagtg 60
 cgaggtgaac ggtgcggggg cgcaccctct ctgcgccttc ctgcgggagg ccctgccagc 120
 tcccagcgac gacgccaccg cgcttatgac cgaccccaag ctcattcacct ggtctccggt 180
 gtgtcgcaac gatgttgctt ggaactttga gaagttcctg gtggggccctg acggtgtgcc 240
 cctacgcagg tacagccgcc gcttccagac cattgacatc gagcctgaca tcgaagccct 300
 gctgtctcaa gggctcagct gtgcctaggg cgcccctct accccggctg cttggcagtt 360
 gcagtgtgc tgtctcgggg gggttttcat ctatgagggg gtttcctcta aacctacgag 420
 ggaggaacac ctgatcttac agaaaatacc ac 452

<210> 471
 <211> 168
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(168)
 <223> n = A,T,C or G

<400> 471
 cttctccgct cttcttanga tctccgcctg gttcggncgc cctgcctcca ctctgcctc 60
 taccatgtcc atcagggtga cccagaagtc ctacaagggtg tccacctctg gccccggggc 120
 cttcagcagc cgctcctaca cgagtggggc cggttccgcg atcagctc 168

<210> 472
 <211> 479
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(479)
 <223> n = A,T,C or G

<400> 472
 gccaggcgctc cctctgtctg ccactcagtc ggcaacaccc gggagctggt ttgtcctttg 60
 tggagcctca ncagttccct ctttcanaac tcaatgccaa gagccctgaa caggagccac 120
 catgcagtcg ttcagcttca ttaagaccat gatgatcctc ttcaatttgc tcatctttct 180
 gngtggcgca gccctggttg cagcgggcat ctgggtgnca atcgatggg catcctttct 240
 gaagatcttc gggccactgt cgtccactgc catgcagttt gtcaacgngg gctacttctt 300
 catcgcagcc ggcgttggtg tntttgctct tggtttcctg ggctgctatg gtgctaanac 360
 tgagagcaag tgtgccctcg tgacgntctt cttcatcctc ctctctctct tcattgctga 420
 ggntgcagnt gctgaggtcc gccttggtgt acaccacaat ggctgagccc ttctgacn 479

<210> 473
 <211> 69
 <212> DNA
 <213> Homo sapiens

<400> 473
 gagcgatgga gcgtgggtag ggagggtcca cagtgtccac tcgccgtgtg cgaaggttga 60
 ctcggtagt 69

<210> 474
 <211> 155
 <212> DNA
 <213> Homo sapiens

<400> 474
 gccgccactg ccgggagagc tcgatgggct tctcctgcgc gccgcccggg gtctggccga 60
 gtccagagag ccgcccgcgc tcgttccgag gagccatcgc cgaagcccga ggccgggtcc 120
 cgggttgggg actgcagggg aaggcagcgg tggcg 155

<210> 475
 <211> 282
 <212> DNA
 <213> Homo sapiens

<400> 475
 ggcttcgacg ttggccctgt ctgcttcctg taaactccct ccaccccaac ctggctccct 60
 cccacccaac caactttccc cccaaccgga aaacagacaa gcaacccaaa ctgaaccccc 120
 tcaaaagcca aaaaatggga gacaatttca catggacttt ggaaaatatt ttttcccttt 180
 gcattcatct ctcaaaactta gtttttatct ttgaccaacc gaacatgacc aaaaacccaa 240
 agtgcattca accttaccaa aaaaaaaaaa aaagggcggc cg 282

<210> 476
 <211> 434
 <212> DNA

<213> Homo sapiens

<400> 476

```
ctccaggaca gcgtccagct tgggtgctgtt gaagacgaag tggagcggat ggttgtagaa 60
acgagtgatg gtgctgagcg gcgtgcagtc ttcgggatcc acgaaggcca agtccttgag 120
gtagagcatg tccacgatgt tggagcgctc ctctctgtac accgggatgc gcgtgtggcc 180
gctctgcatg atgctggcca ggacgccgaa gtccagcacg gtgctggcgt ccagcatgaa 240
gcagtcttcg aggggctga gcacgtctc cacggtccgg cagcgagca cgccttgct 300
gagatcgctg taggggtcgc cgccgccg cgccagctcc agcaccgct cccgcagccg 360
cccgggccgc gccgccagct ccagcagctg cccacgggc agcgcgacgg gcagagtga 420
caggacggcc aggc 434
```

<210> 477

<211> 314

<212> DNA

<213> Homo sapiens

<400> 477

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ggcgggcgct agctggctcc gggcagctcg gccttggggg cttcggggcc ccgagacgcg 60
gggcgtatga gtggggcgctg cgctccacgc ggaagtcgga gcctcctccc ctggataggg 120
tgtacgagat ccctggactg gagcccatca cctttgcggg gaagatgcac ttcgtgccct 180
ggctggcgcg gccgatcttt ccgccttggg accgcggcta caaggacca aggttctacc 240
gctcgcctcc tcttcacgag catccgctgt acaaagacca ggcctgctat atctttcacc 300
accgttgccg cctt 314
```

<210> 478

<211> 317

<212> DNA

<213> Homo sapiens

<400> 478

```
aacagagtga tcattccagt taagcggggc gaagagaata cagactatgt gaacgcatcc 60
tttattgatg gctaccggca gaaggactcc tatatcgcca gccaggggccc tcttctccac 120
acaattgagg acttctggcg aatgatctgg gagtggaaat cctgctctat cgtgatgcta 180
acagaactgg aggagagagg ccaggagaag tgtgcccagt actggccatc tgatggactg 240
gtgtcctatg gagatattac agtggaactg aagaaggagg aggaatgtga gagctacacc 300
gtccgagacc tcttggg 317
```

<210> 479

<211> 171

<212> DNA

<213> Homo sapiens

<400> 479

```
aggtgctttg ctagatgctg tgacaggtat gccaccaaca ctgctcacag cttttctgag 60
gacaccagtg aaagaagcca cagctcttct tggcgtatct atactcactg agtcttaact 120
tttcaccagg ggtgctcacc tctgccccta ttgggagagg tcataaaatg t 171
```

<210> 480

<211> 65

<212> DNA

<213> Homo sapiens

<400> 480

```
ccccagtgga aaggctccca ccctggtaga tgaacagccc ctggagaact acctggatat 60
```


ggagt

65

<210> 481

<211> 207

<212> DNA

<213> Homo sapiens

<400> 481

```
cacagcgtgc tctgcggggt cactcccact ttgttagtga tgtgggtatc tcctcagatg 60
gccagtttgc cctctcaggc tcctgggatg gaaccctgcg cctctgggat ctcacaacgg 120
gcaccaccac gaggcgattt gtgggccata ccaaggatgt gctgagtgtg gcctttctct 180
ctgacaaccg gcagattgtc tctggat                                     207
```

<210> 482

<211> 319

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(319)

<223> n = A,T,C or G

<400> 482

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cacactgtgc cttccagtt gctggcccgg taaaaaggcc tgaacctcac cgaggatacc 60
tacaagcccc ggatttacac ctgcccacc tggagtgcct ttgtgacaga cagttccctgg 120
agtgcacgga agtcacaact ggtctatcag tccagacggg ggccttttgt caaatattct 180
tctgattact tccaagcccc ctctgactac agatactacc cctaccagtg cttccaaact 240
gcacaacacc cnagcttctt cttccagnac aagaggggtg cctggtcctt ggctacctc 300
cccaccatcc agagctgct                                     319
```

<210> 483

<211> 233

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(279)

<223> n = A,T,C or G

<400> 483

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acaggcccag tggcgccctag cttcagctg ctgggctctc ccgagcctgc cttagcccat 60
acaaccactt gatcacgcgg gcattgcgct ccaccaccga cagcccatag ggaacgcgct 120
cccgggcccg ctctcaaca gtcaccgagc tgcggcgggg gcagccccct tcagagctgc 180
ccggcccagc actgggccct gccagggaca cnatatccga gctggcccgt gcc 233
```

<210> 484

<211> 194

<212> DNA

<213> Homo sapiens

<400> 484

```
agagcccttg ctgggggggtg cctgggagat ggggtaagaa gagctttcat ttgtctggta 60
gatagatagc atgtaagggg gtggttgtcc caggaggcag ctgctgacag gtttgctaca 120
```

cacagccccg gactgtgttg cctgggtgct cattcagaga ggggctatca tctgggagcc 180
tgtgccctg ggtc 194

<210> 485

<211> 67

<212> DNA

<213> Homo sapiens

<400> 485

tccatatcca ggtagttctc caggggctgt tcatctacca gggtagggagc ctcccactgg 60
gggaagt 67

<210> 486

<211> 70

<212> DNA

<213> Homo sapiens

<400> 486

taccgagtca accttcgcac acggcgagtg gacactgtgg accctcccta cccacgctcc 60
atcgctcagt 70